THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The pig iron situation has been much strengthened by heavy purchases, which include 40,000 tons of Southern by a selling agency at $13.50, Birmingham, for No. 2; 15,000 tons of Northern foundry on a basis of about $16 at the furnace for No. 2 by an Ohio pipe interest, which also took 5,000 tons of Southern on the $13.50 basis; and the United States Steel Corporation's purchase in the East of 30,000 tons of basic for the Pencoyd works, making a total of 90,000 tons purchased by three interests. Leading malleable interests are also reported in the market. It can not be said, however, that there is a general buying movement. Foundries in the North are not buying, and with the continued offers of resale iron slightly lower prices are coming out, although Valley furnaces are disinclined to go below $16. From Pittsburg the resale of two lots of Bessemer iron at $15.15, Valley furnace, is reported, but operators continue to maintain a minimum of $15.50. Northern basic is easier and has declined 25 cents a ton, but it is probable that the surplus tonnage now offered will be taken by the Steel Corporation, as negotiations are reported under way for a considerable tonnage.

Production of pig iron is now at a rate close to 21,000,000 tons a year, in the light of the January blast furnace statistics, and with a reduction in stocks during January of more than 30,000 tons, a consumption of 21,000,000 tons a year is indicated. Active blast furnace capacity has been increased since February 1, and with other furnaces definitely marked for resumption, the rate of production will be increased to 21,500,000 tons within a very short time. These are large figures considering that the country never made more than about 18,000,000 tons in any calendar year.

The market for Lake Superior ores is showing unexpected activity, due to the placing of orders by late comers, and prices except on Mesabi Bessemer have advanced from 10 to 25 cents per ton.

Following the recent advances in wire and pipe, blue annealed sheets have been advanced $1, galvanized $2 and corrugated galvanized 10 cents a square. An early advance in black sheets is anticipated, although the resale of sheets by overstocked consumers may defer the advance for a time. The stoppage of work in the Kansas oil fields has not yet affected the pipe mills, whose shipments of line pipe to this new oil country have been extremely heavy. Meetings of the plate and structural associations are now on in New York, but sentiment is against an advance at this season. Demand for plates is still limited largely to steel car works, and in structural the largest order of the week is reported from Pittsburg amounting to 4,000 tons for Pennsylvania Railroad elevated tracks.

The rail market was very active during the past week, sales footing up about 100,000 tons, the most important being 48,000 tons for the Baltimore & Ohio; 15,000 tons for the Atlantic Coast Line, 17,000 tons for the Seaboard Air Line; 13,000 tons for the St. Louis & San Francisco R. R., and 500 tons for the Grand Trunk. In scattering lots, the feature was the buying by trolley companies. Inquiries were numerous also and some good business is now pending.

Additional purchases of coke by the Lackawanna Steel Co. for shipment to its Lebanon furnaces, which will resume shortly and will produce Bessemer for shipment to Buffalo, have been an active factor in still further strengthening the coke market. Late purchases aggregate 100,000 tons for shipment through the year at $2.30, and the total amount which this company will take this year from the Connellsville region aggregates half a million tons.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Feb. 15.

Despite the apathy shown by new buyers the market continues strong in practically all its branches. Specifications continue unusually heavy and in most of the finished lines consumers are demanding prompt shipment. The extreme cold weather which has prevailed throughout the country the past few weeks has held up numerous projects and has stopped work on others, but with the advent of milder weather work will be resumed and mill shipments again sent forward. Contrary to expectations, the railroads are handling material throughout this section very well, despite the adverse weather conditions, and furnaces and mills are regularly receiving their supply of fuel.

The Northern iron market is inclined to be easier and resale Bessemer has been disposed of this week on the basis of $15.15 at the furnace, while basic is regularly held at $15.25, a decline of 25 cents a ton. There is practically no demand for steel making iron and the demand for foundry iron in this district is very light. Merchant furnaces in the Valleys refuse to shade $15.50 on Bessemer, but on a large tonnage this price could no doubt be shaded. The Southern iron market is strong at $13.50, large sales during the week having strengthened the situation considerably.

In finished lines advances of $1 a ton have been made on blue annealed sheets and galvanized have been advanced $2, while galvanized roofing has been advanced 10 cents, amounting to nearly $3 a ton. Today a meeting of the structural association is being held in New York and on Thursday the plate manufacturers will meet. Prevailing prices will be reaffirmed without a doubt, as the majority of the manufacturers are opposed to any advances at this season of the year. An advance in black sheets is looked for by the trade, but the adverse weather conditions have prevented consumers from

shipping their finished product and their stocks of sheets have accumulated. As most of this tonnage was purchased on a low basis, some of these stocks have been resold at a profit and slightly under the prevailing market. The stoppage of work in the Kansas oil field by the Standard Oil Co. has not yet heavily affected the pipe mills in this district, as few orders have been held up and in most instances shipments continue. A continued agitation in that field will no doubt result in deferring shipments, but this is not looked for at the present at least, as the entire situation is in strong hands. Muck bar is slightly easier and has sold at $28.20 Pittsburg. Billets and sheet bars continue scarce and independent finishing mills continue to have trouble in securing an adequate supply

This week the Lackawanna Steel Co. purchased a supply of coke for its Lebanon furnaces for shipment the remainder of the year. The contract calls for the shipment of about 100,000 tons, and it is the intention to place these idle stacks in operation about March 1. The Bessemer iron made at these furnaces will be shipped to Buffalo and this independent steel company will no longer be dependent upon the merchant Valley furnaces for a portion of its Bessemer iron supply. The coke was sold on the basis of $2.30 at the ovens. This year the Lackawanna Steel Co. will take about 500,000 tons of coke from the Connellsville region and an effort is now being made to secure a supply of coal from this region in order that the Buffalo coke ovens can be operated next year.

Pig Iron.—The market continues quiet and buying is still to be limited to small lots almost entirely. Some speculative Bessemer iron, amounting to about 2,000 tons, was thrown on the market this week and was sold at $15.15 at the furnace, but it is doubtful whether this will affect the Bessemer iron market. Basic is easier and is held at $15.25 at the furnace and $15.50 could be shaded on Bessemer if a desirable tonnage were offered. On foundry iron $16 furnace can be readily done on No. 2, and a small amount of resale iron is offered slightly below this price. There have been no transactions in forge iron in this market and it is held nominally at $16 Pittsburg. The Massillon Iron & Steel Co. purchased 4,500 tons of Southern iron on the basis of $13.50 Birmingham for No. 2, and other large sales of Southern iron reported during the week have greatly strengthened this market. On Feb. 1 89 percent of the blast furnace capacity tributary to the Lake Superior region was active, as compared with 86 percent on Jan. 1. We revise quotations as follows:

Bessemer, Valley	$15 50
Bessemer, Pittsburg	16 35
No. 1 Foundry	$17 25 to 17 50
No. 2 Foundry	16 85 to 17 10
Gray Forge, Pittsburg	16 00 to 16 10
Basic, Valley	15 25 to 15 35
Basic, Pittsburg	16 10 to 16 20

Steel.—Independent finishing mills still experience considerable trouble in securing an adequate supply of steel and Bessemer billets continue firm at $24.50 to $25, Pittsburg. Few of the steel mills are offering open-hearth on account of the tremendous demands of their own finishing mills, the output not being large enough to meet their own requirements. Sheet and tin bars are held at $26 to $27, and Bessemer and open-hearth rods at $31 to $31.50.

Muck Bar.—The muck bar market is slightly easier, one sale of 2,000 tons being reported at $28.20, delivered, Pittsburg.

Skelp.—Demand for skelp continues heavy on account of the activity of the pipe plants. Steel skelp, grooved, is held at 1.50c to 1.55c, and sheared at 1.60c to 1.65c. Grooved iron is held at 1.70c to 1.75c, and sheared at 1.80c to 1.85c.

Rails and Track Material.—The Baltimore & Ohio railroad placed its contract last week for the year's supply of rails, amounting to 48,000 tons. The United States Steel Corporation received 25,000 tons of the total. Rail tonnage is coming in better than for some time and while it has been a little slow the rail makers are not alarmed and believe that buying will be equal to that of last year at least. There is little demand for light rails and the market is easy. We make the following quotations: Fifty lb. and over 500 tons, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16 lb., $26 to $26.50; 20 lb., $24.50 to $25; 25 to 45 lb., $22.50 to $23. Angle bars, 1.25c; spikes, 1.85c to 1.90c.

Plates.—A meeting of the plate association will be held in New York tomorrow and there is litle doubt that prices will be reaffirmed. The majority of the plate manufacturers are opposed to a plate advance at this time, considering it unseasonable. We quote as follows: Tank plates, 1¼ in. thick, 6¼ to 14 in., inclusive, 1.40c f. o. b. mill Pittsburg; over 14 in. up to 100 in., 1.50c. Extras are as follows per lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c; locomotive firebox, 50c; plates over 100 in. up to 110 in. in width, not less than 5c per 100 lb. extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates, 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, $2 extra; gauges 7 and 8, $3 extra; No. 9, $5 extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except the Pacific Coast.

Structural Material.—A meeting of the beam association is being held in New York today, but no change in prices is anticipated. Much work is being held up on account of the severe weather, but a tremendous tonnage is looked for this year. Prices are unchanged as follows: Beams and channels up to 15 in., 1.50c; over 15 in., 1.60c; angles, 3 x 2 up to 6 x 6, 1.50c; zees, 1.40c; tees, 1.55c; angles from 3 to 16 in., 1.50c; universal and sheared plates, 6¼ to 14 in., inclusive, 1.40c; over 14 in., 1.50c base.

Bars.—Little new business is being received by the mills, but specifications are heavy and on many sizes of steel bars prompt shipments cannot be had. Little new business is being placed in iron bars, but all the mills are comfortably fixed as to tonnage. We make the following quotations: Bar iron, 1.65c to 1.69¼c Pittsburg; hoops, 1.55c, and bands, 1.40c, both taking bar extras. Bessemer steel bars, 1.40c; open-hearth steel bars, 1.40c; plow and cultivator beams, 1.40c, net; channels, angles, zees and tees, under 3 in., 1.05c. The following differentials are maintained on steel: Less than 2,000 lb. of a size and not less than 1,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Sheets.—Effective Feb. 9, the leading interest advanced blue annealed sheets $1, galvanized $2, and corrugated galvanized roofing 10 cents a square. An advance in black sheets is looked for, but it will hardly be made until milder weather sets in. As a result of the large stocks that have accumulated in the hands of consumers at lower prices a considerable tonnage has been resold at slight concessions below the prevailing market. Independents will not quote for delivery in more than 60 days on account of the uncertainty of the steel market, although the leading interest will contract for six months' or a year's supply. We revise quotations as follows: Black sheets: No. 30, 2.70c; No. 29, 2.60c; No. 28, 2.30c; No. 27, 2.20c; Nos. 25-26, 2.15c; Nos. 23-24, 2.10c; Nos. 18-20, 2.05c; No. 16, 2c; Nos. 12-14, 1.95c; No. 9, 1.90c; No. 8, 1.85c. Galvanized: No. 30, 4.35c; No. 29, 3.85c; No. 28, 3.45c; No. 27, 3.25c; Nos. 25-26, 3.05c; Nos. 23-24, 2.85c; Nos. 18-20, 2.70c; No. 16, 2.55c.

Pipes and Tubes.—Shipments of pipe to the Kansas oil field have not yet been deferred on account of the stoppage of work by the Standard Oil Co. and the large independent interests in that field. The demand for merchant pipe continues heavy and prompt shipments con-

tinue to be demanded by jobbers and consumers. Discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination according to Tube Rate Book, are as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	68	52	66	50
⅜ to 6 inches	76	66	74½	64½
⅞ and 8 inch	72	60	70	58
7 to 12 inches	71	56	69½	54
Extra Strong Plain Ends.				
⅛ to ⅜ inch	61	49	59	47
½ to 4 inches	68	56	66	54
4½ to 8 inches	64	52	62	50
Double extra strong plain ends, ½ to 8 inches	57½	46½	55½	44½

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel	Iron.
1 to 1½ inches	46	43
1¾ to 2½ inches	58	43
2½ inches	60	48
2¾ to 5 inches	60	55
6 to 13 inches	58	43

Less than carloads 2 points less.

Wire and Wire Nails.—There is little change in the market, the mills continue to operate in full and are accumulating large stocks in anticipation of a good spring trade. We make the following quotations: Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, and less than carloads, $1.95; painted barb wire, $1.95 to jobbers in carloads; retailers' carloads $2, and less than carloads, $2.10, with 30 cents for galvanizing. Annealed smooth fence wire is held at $1.65, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten days. Iron cut nails are held at $1.85 Pittsburg, and steel at $1.75.

Merchant Steel.—Demand is heavy in all lines and the mills of the Crucible Steel Co. of America are operating in full. There has been no change in prices. We quote as follows: Cold rolled and ground shafting, 52 percent off in carload lots, and 47 off in less than car lots, delivered in base territory; tire steel, 1.60c to 1.65c; open-hearth spring steel, 2c to 2.10c; sleigh shoe, flat, 1.55c to 1.60c; smooth finished machinery steel, 1.60c; toe calk, 1.95c to 2c.

Old Material.—Heavy melting stock is easier and is offered at $16.25, while low phosphorus material is down to $17.50. The decline in the latter is marked and is no doubt due to the heavy offerings that followed the recent sharp decline. The market generally is very quiet. We revise quotations as follows, gross tons: Heavy melting stock, $16.25 to $16.35; low phosphorus, $17 to $17.50; rerolling rails, $16 to $16.50; sheet scrap, $15 to $15.25; No. 1 wrought, $19 to $19.50; cast iron borings, $10.50 to $11.

Coke.—The Lackawanna Steel Co. has again purchased coke, this lot for shipment to its Lebanon furnaces, which will be placed in operation in about two weeks. The coke is for delivery the remainder of the year and calls for the shipment of 100,000 tons. The contract price was $2.30. Prompt furnace coke is selling at $2.50 to $2.60 and foundry at $2.75 to $3. This year the Lackawanna company is taking about 500,000 tons of coke from this region and is now endeavoring to secure a supply of coal for its Buffalo ovens for next year. While there has been no official announcement it is almost certain that the deal for the purchase of the Hecla Coke Co. by the H. C. Frick Co. has been closed and it is reported that other properties are being negotiated for. The United States Steel Corporation is endeavoring to increase its coke supply by the purchase of operating properties, and interesting announcements of new acquisitions are looked for daily. During the week ending Feb. 4, the production of the upper region amounted to 255,916 tons, while the lower region produced 74,864 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, Feb. 14.

The purchase by a selling agency of 40,000 tons of Southern pig iron in the past week is the leading topic of conversation in this market. Aside from this transaction, however, the general trade has continued light. At any other time within the past two years, it is doubtful whether prices could have held up as they have done under the light buying of pig iron since the first of the year. Today, paradoxical as it may seem, the market is strong in its weakness. No disposition is shown anywhere, despite the light trading, to sell at less than $13.50 Birmingham for Southern No. 2 foundry or $17.50 Chicago for Northern No. 2 foundry, the apathy prevailing being considered only temporary. In finished materials, the only change made in the week under review was in galvanized and blue annealed sheets, the former having been advanced $2 a ton and the latter $1 a ton. Billets, rods and sheet bars continue very scarce. Iron and steel bars are a little more active, notably from the agricultural trade which has been buying for its requirements up to July 1. Specifications for plates, structural steel, sheets, pipe and tubes show no diminution from the fact that consumers in the West are well covered on season contracts, new business in these products is of small proportions. Inquiries for heavy rails are active, the leading local producer having booked 20,000 tons in the past week. Track supplies and light rails are also in good demand. The scrap market shows no material change. There is little demand and prices are shaky. Coke is scarce, the recent bad weather having delayed shipments in transit.

Pig Iron.—There is little change to be noted in the local situation. Melters in this section are buying only such iron as they absolutely need, and are generally disposed to postpone their season purchases until they are fully assured there will be no break in prices. Most of them have considerable iron on hand or are protected for the next 60 days by contracts, and consequently under present conditions see no reason for covering for their requirements in the second and third quarters. The inquiry for 15,000 tons of basic iron which has been in the market for several days has not yet been placed, nor has the inquiry from the Pullman Company for 2,700 tons of foundry grades. Owing, however, to recent purchases of Southern iron at $13.50 Birmingham for No. 2 foundry, it is not likely prices will go any lower. One producer in the Birmingham district has withdrawn entirely from the market, having sold the bulk of his output for the second quarter. Sales in the past week have ranged from the 1,000 tons purchased by the International Harvester Co. to carload lots, the latter predominating. In Northern irons trading is light. Prices are unchanged at $17.50 Chicago for No. 2 foundry. We quote as folows:

Lake Superior Charcoal	$18 50 to 19 00
Northern Foundry No. 1	18 00
Northern Foundry No. 2	17 50
Northern Foundry No. 3	17 00
Northern Scotch Foundry	18 50
Ohio Strong Softeners No. 1	19 30 to 19 80
Ohio Strong Softeners No. 2	18 30 to 18 80
Southern Foundry No. 1	17 65 to 18 15
Southern Foundry No. 2	17 15 to 17 65
Southern Foundry No. 3	16 65 to 17 15
Southern Foundry No. 4	16 40 to 16 90
Southern No. 1 Soft	17 65 to 18 15
Southern No. 2 Soft	17 15 to 17 90
Southern Gray Forge	16 40
Southern Mottled	16 40
Southern Silveries (4% to 6% Silicon)	18 65 to 19 15
Jackson Co. Silveries (6% to 8% Silicon)	21 30 to 22 30
Jackson Co. Silveries (8% to 10% Silicon)	23 30 to 24 30
Alabama and Georgia Car Wheel	21 15
Malleable Bessemer	17 50
Basic Iron	17 65 to 18 15

Billets.—Several small lots of forging billets have been purchased in this market in the last week, which is about all the trading that has been done in this material. As a general proposition, billets are very scarce, as also are

other intermediate products. An inquiry for 3,000 tons of wire rods for which the buyer offered to pay $33 Pittsburg could not be filled because the local producer had not the material to sell. All orders command a premium, differing according to the tonnage involved and the relations between the buyer and seller. We quote forging billets, 4 x 4 and larger, up to but not including 10 x 10, up to .25 carbon, $28; up to and including .60 carbon, $1 extra. Rerolling billets, Bessemer or open-hearth, 4 x 4 and larger, $26; billets, 3⅞ in. and smaller and sheet and tin bars, $28. Wire rods are very scarce in this market and the local manufacturer was compelled to decline an order for $1,000 tons a few days ago. This product is firm at $33 Pittsburg.

Bars.—The demand for both iron and steel bars has been active in the week under review. The buying has been monopolized largely by the agricultural implement makers who have been covering for requirements up to July 1st. Specifications against existing contracts continue very heavy. All prices are firm. We quote carload lots, mill shipments, Chicago delivery, as follows: Bar iron, 1.65c; Bessemer and open-hearth bars and bands, 1.56½c base, half extras; soft steel angles, less than 3 x 3, 1.76½c; hard steel angles rolled from old rails, 1.60c to 1.65c; hoops, 1.71½c base, full extras. Store quotations are firm, and we quote on lots from warehouse stocks, as follows: Bar iron, 1.90c to 2c base, full extras; soft steel bars and bands, 1.75c to 1.85c base, full extras; soft steel angles, channels and tees, 1.85c to 1.95c; hoops, 2c to 2.10c base, full extras.

Sheets.—As had been expected for some time, galvanized sheets were last week put up $2 a ton. Blue annealed were also advanced $1 a ton, making the quoted "official" price for No. 16 gauge 1.85c Pittsburg. The latter basis has been in effect for some time in this market, and no change is made necessary in our quotations by the new schedule. Box annealed sheets were unchanged. The demand for both black and galvanized has picked up in the last week, and the new prices are expected to stimulate trading to a greater extent. We quote carload lots, mill shipments, Chicago delivery, as follows: Blue annealed sheets, Nos. 9 to 10, 1.81½c to 1.86½c; Nos. 11 and 12, 1.86½c to 1.91½c; Nos. 13 and 14, 1.91c to 1.96½c; Nos. 15 and 16, 2.01½c to 2.06½c. On box annealed, one pass, cold rolled, we quote Nos. 18 and 20, 2.21½c to 2.26½c; Nos. 22 and 24, 2.26½c to 2.31½c; Nos. 25 and 26, 2.31½c to 2.36½c; No. 27, 2.36½c to 2.41½c; No. 28, 2.46½c to 2.51½c; No. 29, 2.56½c to 2.61½c; No. 30, 2.66½c to 2.71½c. We quote on lots from warehouse stocks as follows: No. 10, 2c to 2.05c; No. 12, 2.05c to 2.10c; No. 14, 2.10c to 2.15c; No. 16, 2.20c to 2.25c; Nos. 18 and 20, 2.40c to 2.45c; Nos. 22 and 24, 2.45c to 2.50c; No. 26, 2.60c to 2.65c; No. 27, 2.70c to 2.75c; No. 28, 2.80c to 2.85c; No. 29, 2.90c to 2.95c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12-14, 2.56½c; No. 16, 2.71½c; Nos. 18-21, 2.86½c; Nos. 22-24, 3.01½c; No. 26, 3.21½c; No. 27, 3.41½c; No. 28, 3.61½c; No. 29, 3.86½c. Jobbers' prices on lots from store have also been revised, and are now as follows: Nos. 10 to 16 inclusive, 3.10c; Nos. 18-20, 3.11c; Nos. 22-24, 3.25c; No. 26, 3.48c to 3.50c; No. 27, 3.70c; No. 28, 3.95c; No. 29, 4.30c to 4.40c; No. 30, 4.85c.

Structural Material.—Specifications for structural shapes continue of the same active proportions as formerly. The extremely cold weather of the last two weeks has delayed the letting of contracts for new business and until the thermometer goes higher no improvement is expected. Prices are the same as last week, and we quote carload lots, mill shipments, Chicago delivery, as follows: Beams and channels, 3 to 15 in. inclusive, 1.66½c; angles, 3 to 6 in., ¼ in. and heavier, 1.66½c; angles larger than 6 in. on one or both legs, 1.76½c; beams larger than 15 in. 1.76½c; zees, 3 in. and over, 1.66½c; tees, 3 in. and over, 1.76½c, with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices have been advanced, and, according to tonnage, are quoted: 1.90c to 2c for angles, beams and channels, base sizes, with 2c to 2.10c for 18, 20 and 24-in. beams; tees and zees, 1.95c to 2.05c. These prices are for either random lengths or cut to specifications.

Plates.—New business is light, but specifications continue very active. Prices are unchanged. We quote carload lots, mill shipments, Chicago delivery, as follows: Tank steel, ¼ in. and heavier, 6¼ in. to 14 in. wide, rectangular plates only, 1.56½c base; over 14 in., to 100 in., 1.66½c base, flange steel, 1.76½c base; marine steel, 1.86½c base, all full extras. Plates, 3-16 in. thick, $2 extra; gauges 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Store prices are very firm. We have revised our quotations as follows: Tank steel, ¼ in. and heavier up to and including 72 in. wide, 1.90c; over 72 in. wide up to 100 in., 1.10c extra; over 100 in. wide, usual mill extras; 3-16 in. up to but not including 72 in. wide, 2c; 3-16 in., 72 in. wide, 2¼c; flange steel, 25c extra; heads, 25c extra.

Rails and Track Supplies.—Contract for over 20,000 tons of standard rails have been placed with the local mill in the week under review. Inquiries for other lots are numerous and a good sized tonnage is pending. Light rails and track supplies are in brisk demand. Prices are without change. We quote heavy sections in 500-ton lots and over, f. o. b. bill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12-lb. sections, $27; 16-lb., $26; 20 and 25-lb., $25; 30, 35, 40 and 45-lb. sections, $24, all f. o. b. Milwaukee mill. Track supplies, f. o. b. Joliet mill: Angle bars, 1.40c to 1.50c; spikes, first quality, 1.70c to 1.75c; track bolts, 3¼ x ¾, with square nuts, 2.40c to 2.50c per lb., with hexagon nuts, 2.55c to 2.65c.

Merchant Steel.—Specifications are good and prices firm. The season for letting new contracts is not yet at hand, and until it arrives much new business is not expected to be let. Prices are firm and without change. We quote carload lots, mill shipments, Chicago delivery, as follows: Spring steel, 2c; sleigh shoe, flat sizes, 1.61½c; concave and convex, 1.76½c; cutter shoe, 2.25c; smooth finished machinery steel, 1.81½c; smooth finished tire, 1.76½c; plow steel, 2.20c and upwards, according to quality; toe calk steel, 2.11½c. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and upwards. Cold rolled shafting is quoted as 52 percent from list on carload lots, and 47 percent discount on less than carload lots.

Merchant Pipe.—The new prices put into effect on the first of the month have stimulated specifications considerably. We quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¼ inches.....	66.35	50.35	64.35	48.35
⅜ to ⅝ inches.....	70.35	58.35	68.35	56.35
¾ to 6 inches.....	74.35	64.35	72.85	62.85
7 to 12 inches.....	69.35	54.35	67.85	52.35
EXTRA STRONG PIPE.				
⅛ to ¾ inches.....	59.35	47.35	57.35	45.35
½ to 4 inches.....	66.35	54.35	64.35	52.35
4½ to 8 inches.....	62.35	50.35	60.35	48.35
DOUBLE EXTRA STRONG PIPE.				
½ to 8 inches.....	55.35	44.35	53.35	42.35

Boiler Tubes.—A number of large boiler manufacturers have bought a good round tonnage in the week under review, and the market is enjoying a better tone than it has felt for several weeks. Local jobbers' prices still disagree. We quote carload lots, mill shipments, as follows:

BOILER TUBES.

	Steel.	Iron.	Seamless.
1 to 1½ inches	42.35	39.35	52.35
1¾ to 2¼ inches	54.35	39.35	40.35
2½ inches	56.35	44.35	43.35
2¾ to 5 inches	62.35	51.35	Up to 4 inches. 50.35
6 to 13 inches	54.35	39.35	.....

Less than carload lots from store, as follows:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches, inclusive	40½	37½	40
1¾ to 2¼ inches, inclusive	50½	35	37½
2½ inches, inclusive	55	37½	40
2¾ to 5 inches, inclusive	60¼	47½	47½
6 inches and larger	50½	35	

Cast Iron Pipe.—The only new inquiries that have come into the market since our last report are one from Milwaukee for 1,600 tons and another from Santa Rosa, Cal., for 1,700 tons. Both will be let this month. Prices are firm and unchanged. We quote carload lots, Chicago delivery, as follows: 4-in. water pipe, $28.50; 6-in. and larger, $27.50; gas pipe, $1 a ton higher.

Wire Products.—No diminution is to be noted in the demand for all kinds of wire products. Jobbers and manufacturers are specifying freely against their contracts, and the entire output of mills goes into immediate consumption. Prices are without change, and we quote carload lots to jobbers, mill shipments, Chicago delivery, as follows: Wire nails, $1.95; painted barb wire, $2.10; galvanized barb wire, $2.40; smooth annealed wire, $1.80; smooth galvanized wire, $2.10; polished staples, $2.05; galvanized staples, $2.35. Less than carload lots to jobbers are 5 cents higher than above prices. The retail trade is quoted 5 cents extra over the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½ and 5 percent to 85 percent discount f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet and DeKalb, with actual freight allowed not exceeding 30 cents per 100 lb.

Foundry Coke.—The continuance of the cold weather has done much toward retarding the transit of coke en route. There is very little on local tracks, and a prolongation of the cold snap for any length of time will result in a fuel famine in Chicago and points west of this city. Prices are firm on the basis of $3 at Connellsville for 72-hour foundry or $5.65 Chicago in car lots. Less popular brands of Virginia and West Virginia cokes are selling at from $2.50 to $2.75 at the ovens. Wise County, Virginia, coke at $3 at the ovens, makes the going price here $5.25.

Old Material.—The apathy in scrap continues, and wrought pipe, No. 1 cast, No. 1 boilers, iron car axles, steel car axles, railroad malleable are down from 50 cents to $1 from last week's quotations. It is expected, however, that the severe weather prevailing will push prices up again. At the present time the market is without life. We have revised our quotations, and give dealers' selling prices, gross tons, as follows:

Old steel rails (4 feet and over)	$15 00 to 15 50
Old steel rails (less than 4 feet)	15 00 to 15 50
Old iron rails	21 00 to 21 50
Relaying rails, subject to inspection	22 00 to 22 50
Relaying rails, without inspection	20 00 to 20 50
Old wheels	16 50 to 17 00
Heavy melting steel	14 50 to 15 00
Mixed country steel	9 50 to 10 50
Low phosphorus scrap (.05 and under)	14 00 to 14 50

The following quotations are for net tons:

No. 1 R. R. wrought	17 00 to 17 50
No. 2 R. R. wrought	16 00 to 16 50
Shafting	17 00 to 17 50
Dealers' forge, No. 1	14 00 to 14 50
Wrought pipe and flues	11 00 to 11 50
No. 1 cast, 150 lb. and less	13 50 to 14 00
No. 1 mill	11 00 to 11 50
No. 1 Busheling	11 50 to 12 00
No. 2 Busheling	10 50 to 11 00
Country sheet	8 00 to 8 50
No. 1 boilers, cut	11 00 to 11 50
Boiler punchings	13 00 to 13 50
Iron car axles	21 00 to 21 50
Steel car axles	16 50 to 17 00
Iron axle turnings	11 50 to 12 00
Steel axle turnings	11 00 to 11 25
Cast borings	8 50 to 9 00
Mixed borings, etc	8 50 to 9 00
Machine shop turnings	11 00 to 11 50
Railroad malleable	13 50 to 14 00
Agricultural malleable	12 00 to 13 00
Stove plate and light cast scrap	11 00 to 11 50
Old iron splice bars	18 00 to 18 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, Feb. 15.

Iron Ore.—The market is showing renewed activity, which is rather surprising in view of the heavy sales made since Jan. 1, which amount to more than the sales of the entire year 1904. Nearly all of the selling interests have sold about all they expect to have for sale. Prices, except on Mesabi Bessemer, have advanced from 10 to 25 cents and quotations are now as follows: Old range Bessemer, $4; Mesabi Bessemer, $3.50; old range non-Bessemer, $3.35; Mesabi non-Bessemer, $3.10 to $3.25.

Pig Iron.—The market is very quiet. Sales are not numerous and are for small lots. Bessemer is not quite so strong and basic is in similar condition. Northern foundry is apparently firm at $16 at the furnace for No. 2, but a large order might be placed at a slightly lower figure. Southern brands are not in demand in this city, but sales in other markets have made it firmer at recent quotations. We quote as follows, Cleveland delivery:

Bessemer	$16 35
No. 1 Foundry	$17 00 to 17 50
No. 2 Foundry	16 50 to 16 85
No. 3 Foundry	15 75 to 16 00
No. 2 Southern	17 35 to 17 85
Gray Forge	16 00 to 16 25
Gray Forge, Southern	15 85 to 16 35
Lake Superior charcoal	18 00 to 18 50

Finished Material.—There has been some inquiry for heavy rails, but the market has been devoid of important developments. The expected lower quotation on bar iron has not been announced and 1.65c at the mills is still the ruling price, although the demand is not brisk. Steel bars lag in shipments. The price remains 1.49½c Cleveland. The prices of galvanized sheets have been advanced $2 per ton and of blue annealed $1 per ton. The prices of the principal producers through jobbers are as follows: Cleveland delivery, the freight from Pittsburg being 9½ cents: Mill sales of black sheets in carload lots, No. 10, 1.84½c; Nos. 11-12, 1.89½c; No. 14, 1.94½c; No. 16, 2.04½c; No. 27, 2.39¼c; No. 28, 2.40¼c. Galvanized, mill sales, No. 14, 2.64½c; No. 16, 2.74½c; Nos. 18-20, 2.89½c; Nos. 22-24, 3.04½c; Nos. 25-26, 3.24½c; No. 27, 3.44½c; No. 28, 3.64½c. Out of stock, black sheets, ¼ in., 1.85c; 3-16 in., 1.95c. Blue annealed, No. 10, 2.05c; No. 12, 2.10c; No. 14, 2.15c; No. 16, 2.25c. One pass cold rolled: Nos. 18-20, 2.45c; Nos. 22-24, 2.50c; No. 26, 2.55c; No. 27, 2.60c; No. 28, 2.70c; No. 30, 3.10c. Galvanized out of stock, No. 16, 2.95c; Nos. 18-20, 3.05c; Nos. 22-24, 3.50c; No. 26, 3.40c; No. 27, 3.60c; No. 28, 3.80c; No. 30, 4.60c.

Old Material.—The market is quiet, but there is not as much evidence of weakness in some lines as there was last week. Rolling mills are not buying to any large extent, but the demand for heavy steel is stronger. We quote as follows, gross tons, Cleveland:

Old iron rails	$23 50 to 24 00
Old steel rails (over 6 feet)	16 00 to 16 50
Old steel rails (under 6 feet)	17 00 to 17 50
Old car wheels	17 50 to 18 00
Steel boiler plate	13 00 to 13 50
Steel axles	18 00 to 19 00
Malleable iron (railroad)	15 00 to 15 50
Malleable iron (agricultural)	14 00 to 14 50
Heavy steel	16 50 to 17 00

We quote as follows, net tons:

No. 1 R. R. wrought	16 50 to 17 00
No. 1 busheling	14 50 to 15 00
No. 1 machine cast	14 50 to 15 00
Iron axles	19 00 to 20 00
Axle turnings	13 00 to 13 50

Wrought turnings (free from cast)	12 00 to 12 50
Grate bars	10 00 to 10 50
Pipes and flues	13 00 to 14 00
Tank iron	10 50 to 11 00
Hoop and band iron	9 00 to 10 00
Sheet iron	7 00 to 8 00
Wrought drillings	12 00 to 12 50
Stove plate	10 50 to 11 00
Cast borings	8 00 to 8 50

CINCINNATI.

Feb. 14.

Coke.—The market is easy and prices are being quietly shaded on contracts, but current quotations are not widely different from a week ago. Foundry coke ranges from $2.75 to $3.25 f. o. b. ovens. Furnace coke is quiet at a quotable level of $2.50 to $2.75 per ton f. o. b. ovens. There is considerable trouble now in getting shipments forward, owing to transportation difficulties incident to winter weather.

Pig Iron.—The notable incident of the week has been the purchase by a large selling interest of about 40,000 tons of Southern iron on a basis of $13.50 for No. 2 foundry at Birmingham. This purchase by a selling interest has had a tendency toward strengthening the feeling of the trade, coming as it does at a time when the rank and file of buyers are letting the market severely alone. Two other large purchases are also reported; one being a purchase of 15,000 tons of Southern iron at $13.50 Birmingham and 5,000 tons of Northern iron by a Central Ohio cast iron pipe manufacturer. A Southern cast iron pipe maker is reported to have taken 8,000 tons and sales agents report sales of smaller tonnages, aggregating about 10,000 tons. It will be noted that while a large tonnage was sold during the week, the buying was confined to a few purchasers, which some in the trade do not regard with the same significance as they would scattering purchasing aggregating an equal amount. These sales, however, have undoubtedly furnished a basis for regarding the market with more confidence and some large melters who have been holding off are now said to be seriously considering the placing of orders for a considerable tonnage. In Northern irons the situation is unchanged, and $16.00 furnace in Ohio is still minimum. So far as general conditions are concerned there is but little change from a week ago, and inquiries are light and mainly for lots of from 100 to 200 tons. We make no change in quotations, which are as follows, f. o. b., Cincinnati:

Southern Foundry No. 1	$16 75 to 17 00
Southern Foundry No. 2	16 25 to 16 50
Southern Foundry No. 3	15 75 to 16 00
Southern Foundry No. 4	15 50 to 15 75
Southern Foundry No. 1, soft	16 75 to 17 00
Southern Foundry No. 2, soft	16 25 to 16 50
Gray Forge	15 25 to 15 50
Northern Foundry No. 1	17 65 to 18 15
Northern Foundry No. 2	17 15 to 17 65
Northern Foundry No. 3	16 65 to 17 15
Southern Charcoal	19 50 to 19 75

Finished Material.—The market continues active in a jobbing way and a strong tone prevails. The demand for structural from yard is active and mills are behind in orders, so that jobbers are getting an active trade on orders to fill out on work that is under way. Bar iron is quoted at 1.75c; steel bars at 1.53c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets at 75 and 10 and 5 percent off. We quote black sheets, No. 27, at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are firm and sell out of stores at 1.90c for ¼-in. and 1.95c for 3-16 No. 8 and No. 10. Beams and channels are quoted at 1.90c to 2c from stock, and angles at 1.95c to 2c for these sizes.

In merchant pipe there is a good inquiry, which, however, does not result in much increase in tonnage and it appears that buyers are testing the market or getting a line on prices for bidding purposes. There is no change in prices, and, so far as can be learned, the independent mills are not shading prices to any disturbing extent.

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed. Wrought Iron Pipe. Black. Percent.	Guaranteed. Wrought Iron Pipe. Galv. Percent.
⅛ and ¼ inches	66.35	50.35	64.35	48.35
⅜ and ½ inches	70.35	58.35	68.35	56.35
¾ to 6 inches	74.35	64.35	77.85	62.85
7 to 12 inches	69.35	54.35	67.85	52.35

Old Material.—There is no quotable change in the market, but there is scarcely any trading, as the demand is lacking. There is not enough inquiry to offer an inducement to shade values. We quote:

Old No. 1 railroad wrought, net tons	$16 50 to 17 00
Cast machine and foundry, net tons	13 50 to 14 00
Old iron rails, gross tons	20 00 to 21 00
Old steel rails, gross tons	15 00 to 15 50
Old short lengths, gross tons	14 00 to 14 50
Old iron axles, net tons	19 00 to 20 00
Stove plate, net tons	9 50 to 10 00
Wrought turnings, net tons	12 50 to 13 00
Cast borings, net tons	9 00 to 9 50

PHILADELPHIA.

Feb. 14.

The tremendous consumption of iron indicates that the prevailing conditions are sound, but many machine shops and foundries still complain of slack business. The concerns which are most active are those which sell to manufacturers of cars and locomotives.

Pig Iron.—Buyers say they have ordered as far in advance as they care to do at present and the market is not active, but it is strong. We quote as follows for Philadelphia delivery:

No. 1 X foundry, $17.75 to $18.00; No. 2 X foundry, $17.50 to $17.75; No. 2 plain, $16.75 to $17.00; standard gray forge, $15.50 to $16.00; ordinary gray forge, $15.25 to $15.50; basic, $16.50; low phosphorus, $20.00 to $20.25.

Steel.—There is a good demand for steel and prices are firm, with an upward tendency. About $27 would be the price for ordinary business, a shade less perhaps on a specially desirable order, with the usual advance on special sizes.

Finished Material.—New orders are neither numerous nor heavy, but specifications are coming in freely and the mills are fairly busy. We quote as follows:

Beams, channels and angles, according to specifications, 1.63½c to 1.75c; refined iron bars, 1.63½c to 1.70c; steel bars, 1.53½c to 1.60c; plates, ¼ in. and thicker, 1.63½c to 1.65c.

Old Material.—Desirable stock is being held above the views of buyers, and as holders are firm at current prices, transactions are very light. Current quotations for delivery in buyers' yards are about as follows:

No. 1 steel scrap, $17.25 to $17.75; low phosphorus scrap, $20.00 to $21.50; old steel axles, $20.50 to $21.00; old iron axles, $23.00 to $24.00; old iron rails, $23.00 to $24.00; old car wheels, $16.00 to $16.50; Choice RR No. 1 wrought, $21.50 to $22.00; machinery scrap, $15.50 to $16.00; wrought turnings, $14.50 to $15.00; cast borings, $11.25 to $11.50; stove plate, $13.50 to $14.00; wrought iron pipe, $16.50 to $17.00.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, NO. 150 NASSAU ST., Feb. 14.

Pig Iron.—There was more activity in the local pig iron market during the past week than for the two weeks previous. One of the reasons which contributed largely to this was the action of furnaces, both North and South, in accepting orders at the minimum prices that have prevailed during the past month. Thus, at Eastern Pennsylvania furnaces Northern No. 2 foundry sold at $16.50, while Southern No. 2 foundry sold in round lots at $13.50 at Birmingham. Both prices are about 25 cents per ton lower

than actual sales to any extent for the past few weeks, with this particularly true of the Northern iron quotation. Prices practically remain at these figures at this writing, but it is not as easy to purchase in conformity with them as it was earlier in the week. In fact, there are some furnaces which are now asking, and claim they are receiving, prices that are 25 cents per ton higher than those we have mentioned. Another reason for the increased activity for the past week was the greater willingness of buyers to contract for their anticipated requirements for the second quarter. This is particularly true of the first portion of it. There is also said to be pretty fair buying for the third quarter, but our advices are that the most buyers are reluctant about doing anything for this delivery. There are some representative furnaces which object to taking contracts for it also. With melters the uncertainty of business is the controlling factor, while with producers it is a case of believing that it is to their interest to wait. New York quotations at tidewater follow: Northern No. 1 foundry, $17.50 to $18; No. 2 foundry, $17.25 to $17.50; No. 2 plain, $16.75 to $17; Southern No. 1 foundry, $17.50 to $17.75; No. 2 foundry, $17 to $17.25; No. 3 foundry, $16.50 to $16.75; No. 4 foundry, $16 to $16.25. Pig iron warrants are as follows:

	Bid.	Asked.
March	$16 10	$16 40
April	16 20	16 40
May	16 15	16 30
June	16 15	16 50
July	16 05	16 40

Finished Iron and Steel.—There was the usual run of small orders in structural shapes during the past week, which made up a fairly good tonnage, but so far as orders of any magnitude go, the situation was quiet. There are several of the latter hanging fire, however, and said to be in excellent shape for closing. They relate mostly to railroads. Manufacturers of structural material are scheduled to meet this week, with opinions divided as to probable action on prices. There are persistent advocates of no change in prices, and of advancing them, with the latter in the majority. In plates the week was marked by increased activity, in anticipation that when manufacturers meet this week an advance of several dollars per ton will be made. Buying in bars is of a moderate character, with conditions practically the same in sheets. New York prices at tidewater follow: Angles, 3 to 6 in. x ¼ in. and heavier, 1.64½c; beams, 3 to 15 in., 1.64½c; channels, 3 to 15 in., 1.64½c; beams, 18, 20 and 24 in., 1.74½c; tees, 3 x ¼ in. and heavier, 1.69¼c; plates, carloads, tank, 1.64½c; flange, 1.74½c; marine and ordinary fire box, 1.84½c; refined iron bars, 1.64½c; soft steel bars, 1.54½c to 1.60c; sheets, in carload lots, New York, No. 28, black, 2.50c to 2.55c; galvanized, 3.55c to 3.60c.

Old Material.—The local market for the past week has not been very active, so far as sales were concerned, but inquiry has been excellent, with buyers and sellers largely at variance in the matter of prices. This averages about $1 per ton. Prices on the whole are unchanged, but are firmer than a week ago. Holders claim the mills are carrying less stock now than for months past. Approximate prices here f. o. b. cars follow:

Old iron rails	$20 00 to 22 00
Old steel rails, long lengths	16 00 to 17 00
Old steel rails, short pieces	15 50 to 16 50
Relaying rails	21 00 to 22 00
Old car wheels	16 00 to 16 50
Old iron car axles	21 00 to 21 50
Old steel car axles	17 00 to 18 00
Heavy melting steel scrap	16 00 to 17 00
No. 1 railroad wrought scrap	19 00 to 21 00
Iron track scrap	17 00 to 18 50
Wrought pipe	13 00 to 14 00
Ordinary light iron	12 00 to 13 00
Cast borings	10 00 to 10 50
Wrought turnings	12 50 to 13 50
No. 1 machinery cast	13 00 to 13 50
Stove plate	15 50 to 16 50

BIRMINGHAM.

BIRMINGHAM, Ala., Feb. 13.—Alabama furnacemen during the past week sold a large quantity of iron, the Sloss-Sheffield Steel & Iron Co. alone accepting one order for 20,000 tons, delivery within four months. Other companies sold greatly in excess of their make for the same period, a week. A strong inquiry is being received for pig iron in this section and the indications are that there will be many sales made. The market is very firm and quotations are strong. No. 2 foundry iron is selling at $13.50 to $14 per ton, though rumors were heard that some iron at $13 and $13.25 per ton had been sold by Alabama manufacturers. There is no verifications to the rumors mentioned, $13.50 per ton appearing as the lowest price acceptable to the furnace companies for No. 2 foundry.

Inclement weather has had some effect on the iron production, causing some hesitation in the steady supply of raw material. A steady rain or extremely cold weather has been the rule in this section for the past two weeks, interfering considerably with the outdoor work.

The Alabama Consolidated Coal & Iron Co. is making iron again at Gadsden, fire being placed in the furnace during the past week. The iron-maker was thoroughly repaired. Col. T. G. Bush, of the Alabama Consolidated Coal & Iron Co., states that the new blood in the company (International Power Co.) will mean much for the Birmingham district. The erection of another large furnace is proposed, but exactly where it will be located, whether Mary Lee, Jefferson county, or Gadsden, Etowah county, has not yet been decided upon. The company owns considerable property at both places. At Mary Lee the company has extensive coal lands with plenty of water, while at Gadsden there is plenty of ore, water and other material and conveniences.

The annual meeting of the Lookout Mountain Iron Co. will be held in Birmingham this week. In addition to the selection of a board of directors and officers for the ensuing term, a proposition to issue first mortgage bonds will be voted on. The issue will be for not less than $400,000, which will be used in making improvements. Rumors prevail that the Lookout Mountain Iron Co. may be the nucleus of a big consolidation in the Birmingham district.

The accumulated iron stacks in the Birmingham district are dwindling rapidly. Less than 25,000 tons of iron are being held in this State unsold.

The following quotations are given for pig iron in Alabama: No. 1 foundry, $14 to $14.25; No. 2 foundry, $13.50 to $14; No. 3 foundry, $13 to $13.25; No. 4 foundry, $12.50 to $12.75; gray forge, $12 to $12.50; No. 1 soft, $14 to $14.25; No. 2 soft, $13.50 to $14.

No change is reported in the steel situation in this State. Preparations are still being made for further improvements at the big steel plant of the Tennessee Coal, Iron & Railroad Co. at Ensley. Railroad tracks in the steel plant yards will be removed in order that the space thus taken up can be used for the proposed improvements.

The several rolling mills in operation in Alabama report conditions fairly good, with a steady demand for the product. The rolling mills of the Tennessee Coal, Iron & Railroad Co., at Bessemer, are handling only steel.

The strike of the union coal miners in Alabama continues. The furnace companies whose mines were affected have secured a large number of non-union men and are getting out a large quantity of coal. The visit of President John Mitchell, of the United Mine Workers of America, did not bring about any result.

The annual meeting of the directors of the Maryland Steel Co. was held at the office at Sparrow's Point, Md., Feb. 8. Routine business only was transacted, and the old board of directors was re-elected. In the absence of President Frederick W. Wood, who is in Cuba at present, his brother, R. K. Wood, general agent of the Maryland Steel Co., acted as host. After a visit to the plant, luncheon was served.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., Feb. 14.

Tin.—Prices at this writing are higher than a week ago, and their strength, in view of recent heavy arrivals, as well as those en route, coupled with the extremely light buying by consumers, is looked upon as surprising. The London market has been active on speculative buying by local interests, with futures commanding a high premium. Today's closings follow: Spot, 29.25c to 29.65c; February, 28.75c to 29.05c; March, 28.65c to 29.00c; April, 28.50c to 28.85c. London's closings today follow. Spot, £132; futures, £137 6s. Arrivals at Atlantic ports for the month to date aggregate 3,200 tons, with 2,345 tons afloat.

Copper.—Prices continue the same as they have been for weeks, but the trade situation is not as good as it has been. Domestic buying is lighter, if anything, while that for foreign account, which has been the mainstay of the market for months past, is being done cautiously nowadays and in decreasing amounts. London has been fairly active during the week with prices showing little change from those we quoted last week. Closing prices today follow: Lake, 15¼c to 15⅜c; electrolytic, 15⅛c to 15¼c; casting, 14⅞c to 15c. London's closings today follow: Spot, £67 7s 6d; futures, £67 15s. Exports for the month to date aggregate 4,466 tons.

Lead.—Is firm and unchanged at 4.55c to 4.60c for spot. St. Louis is a shade lower at 4.35c to 4.37½c. London declined to £12 8s 9d.

Spelter.—Continues quiet and easy at 6.10c to 6.20c for spot. St. Louis is lower at 5.97½c. London is stronger at £24 17s 6d.

Antimony.—All brands are unchanged. Cookson's is 8.25c to 8.50c. Hallet's, 8.50c to 9.00c. Other grades 7.37½c to 8.00c.

Quicksilver.—We quote $40 per flask of 75 lb. lots of 100 flasks. London is £7 12s 6d.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, Feb. 14.

The manipulation of the spelter market, coupled with the scarcity of that product, has resulted in a further advance of one-quarter cent. Pig tin has also gone up one-eighth cent because of the decreased foreign importations. Copper is without change. Demand for all metals is light, and covers current needs only. Our prices are as follows: Lake copper in carloads, 15⅜c; in less than carloads, 15⅝c. Casting copper, in carloads, 15⅛c; less than carload lots, 15⅜c. Pig tin, carload lots, 30⅛c; less than carload lots, 30½c. Spelter, 6¼c to 6½c for carload lots, and 6½c to 6¾c for smaller lots. Sheet zinc is unchanged at 7¼c for carload lots of 600-lb. casks, and 7½c for less than carload lots. Pig lead, 4.45c for 50-ton lots; 4½c for carload lots, and 5c to 5¼c for less than carload lots. Antimony is 9½c for Cookson's and 9c for Hallett's in small quantities. Nickel is 45c to 60c, according to amount and deliveries.

Old metals are sharing in the weakness felt in the iron and steel scrap market. Dealer's quotations are approximately, as follows: Copper wire, 13¼c; copper, heavy, 13c; light copper, 12c; red brass, 11⅞c; red brass borings, 10c; yellow brass, 9c; yellow brass borings, 7⅞c. Lead, 4¼c. Tea lead, 3.70c. Zinc, 4½c.

The Imperial Brass Mfg. Co., 245 South Jefferson street, Chicago, has been organized to manufacture carbureters and injectors and do a general line of brass and aluminum work. The president is Charles McNellis, for the past 16 years vice president and general superintendent of the Turner Brass Works, and the secretary is W. S. Noyes, for nearly 14 years secretary and treasurer of the Turner Brass Works, Chicago.

HEAVY BUYING OF PIG IRON.

(Special Telegram.)

PITTSBURG, Pa., Feb. 15.—Heavy purchases of pig iron, together with inquiries for large lots, have brought about a complete reversal of the iron situation, which for the past three weeks was inclined to be weak. Leading western malleable interests are reported in the market for a heavy tonnage, which will be placed at from $15.25 to $15.40, Valley furnace. An Ohio pipe interest has just closed for 15,000 tons of foundry iron for delivery through the first half at a little better than $16 at the furnace for No. 2. This same interest took 5,000 tons of Southern iron on the basis of $13.50 Birmingham for No. 2. The United States Steel Corporation's purchases of basic for its Pencoyd works aggregate 30,000 tons, placed with Eastern furnaces. With the large Southern sales of iron concluded this week, the total large sales negotiated in the past two weeks aggregate close to 125,000 tons.

The contract for the electric generators in the Carnegie Institute building at Pittsburg has been let to the National Electric Co., of Milwaukee. It consists of five 300 k. w., 120 r. p. m., 12 pole, 125 volt, direct current engine type generators. These machines will be of the latest design and best material, of massive, though pleasing, appearance, the heavy outline being relieved by the elliptical section of the frame. All visible bolts will be nickel plated and the field coils taped on the outside and finished with a wrapping of fish net cord. The terminal boards will be of Vermont marble. The total net weight of each generator will be about 55,000 lb., the armature and commutator accounting for 18,000 lb. On the final test the generators will be expected to withstand a momentary overload of 75 percent without flashing and to operate from no load to 25 percent overload without shifting the brushes.

At the annual meeting of the stockholders of the Pittsburg Coal Co., Pittsburg, held last week, the annual report presented showed earnings of $3,577,682, as compared with $6,751,025 the previous year. President F. L. Robbins in his report stated that the agreements with lake operators for the shipment of coal to the Northwest had been terminated and the company will hereafter sell direct to consumers.

Architects have been engaged by the Winton Motor Carriage Co., Cleveland, to prepare plans for a number of new buildings, which when completed will increase the capacity of the plant by one-third. The new buildings will be a combination foundry and metal working shop, an automobile repository and an office building. The new foundry and metal working shop will be a one-story brick structure, 400 x 100 ft.

During a 24-hour run the Monessen, Pa., plant of the Carnegie Steel Co. last week produced 204,000 lb. of 1¾-in. bars on a 9-in. mill, breaking all previous records.

The Franklin Iron Mfg. Co., Franklin Springs, New York, will blow in its Franklin furnace March 15. The stack has been idle since Oct. 23, 1903. Repairs are now being made.

The plant of the Newburyport Car. Co., Newburyport, Mass., has been sold to William F. Runnells, subject to ratification by the creditors.

The Somerville Machine & Mfg. Co., Pittsburg, will erect a new plant on Second avenue of slow burning construction, 74 x 89 ft. and six stories high.

THE CARNEGIE TECHNICAL SCHOOLS.

It is proposed to build at once the schools for journeymen and apprentices of the Carnegie technical schools at Pittsburg. These schools will be established for the technical instruction of men and women in scientific and industrial pursuits.

A site of thirty-two acres, adjoining Schenley Park, has been provided for the use of the schools in the erection of the necessary buildings. Andrew Carnegie has promised to erect and equip these buildings, and has empowered the trustees of the institute to carry the project into effect. The schools will comprise an administrative group designed to house the executive department, make provision for the social development of the students, and provide an auditorium for the assemblage of the entire school. There will be a school of applied science, operative for day and night students, and for the training of young men over sixteen years old for two or three years, for draughtsmen, inspectors, foremen, engineers' assistants and other positions above those of the skilled mechanic, where intelligence and technical information are more essential than dexterity. In this school a large part of the instruction, including that in shop work, will be given in laboratories, draughting rooms, etc. To make this instruction thorough and effective, the entire equipment will be of the most modern type. The machinery and appliances will be of such character and so used that an economic use of labor and material can be utilized in a manner similar to that found in the commercial shops.

The school for apprentices and journeymen is adapted to the night instruction of students. It will offer a system of instruction for the further education of apprentices already at work in the trade, who will receive technical and theoretical information, coupled with a fair amount of that practical demonstration necessary to their ultimate advancement into the ranks of skilled mechanics. The course of instruction will be so arranged that the students will have an opportunity to acquire familiarity with materials, knowledge of the basic principles employed, and of mechanical and working drawings, elements of physics and chemistry, and a familiarity with new materials and the most modern tools. The shops, laboratories and class-rooms required for this school will be equipped in the most complete manner.

The technical school for women will give instruction to day and evening students. It will be strictly practical in character and will have for its principal aim the training of women to earn their livelihood. Its purpose will be to give to them a technical training or special skill in various subjects, which will increase their earning power. There will be practical instruction in millinery, dressmaking, etc.

The school of applied design will accommodate classes in the design, technique and mechanical processes of the various art industries specified. The purpose of the school will be to instruct those who aspire to become skilled workers as well as designers, after a reasonable amount of experience, who are familiar with the technical requirements of these industries.

The Becker-Brainard Milling Machine Co., of Hyde Park, Mass., has sent us a calendar with views of the plant and its product. The calendar is of generous size and with prominent numerals, a combination of much usefulness for office purposes.

The Cosmopolitan Range Co., manufacturer of cooking ranges and utensils, New York, has been placed in the hands of a receiver. Liabilities are about $22,000 and nominal assets, $50,828.

The Niles-Bement-Pond Co. has declared the regular quarterly dividend of one and a half percent on the preferred stock.

PORTABLE BOILERS AND AIR COMPRESSORS.

There is a demand in many industries for a portable air compressing outfit which can easily be carried from one location to another and used for the operation of drills, chipping and riveting tools, sand blasting and similar purposes. The outfit illustrated herewith has been designed by the Clayton Air Compressor Works, of New York. It is entirely self-contained, as the boiler, compressed air receiver, air compressor, and the circulating pump for cooling the air-cylinder jackets are all mounted on one truck.

For riveting hammers the compressor is proportioned to deliver air at about 100 lb. pressure per square inch, while for sand blasting and stone cutting tools, air is supplied at 70 lb. pressure. The receiver permits the storing of air so that a much larger number of tools may be operated than otherwise, since it is only occasionally that all tools are in operation at the same time. The pressure of the air is maintained by a pressure governor, while the compressor is prohibited from running away, in case of a break on the air line, by a fly-ball speed governor, the two governors being so combined that they operate upon a common throttle valve.

THE CLAYTON PORTABLE AIR COMPRESSOR.

The compressor engine exhausts into the stack, thus increasing the draught. The air compressor cylinder walls are jacketed and are supplied with cooling water by a small duplex pump.

Negotiations looking to the sale of $10,000,000 5 percent bonds of the Republic Iron & Steel Co. have been closed. The bonds will be purchased by prominent banking houses of New York and Chicago. The bonds were authorized more than a year ago. Owing to the uncertain financial outlook, however, it was impossible to sell them except at a heavy discount, and $6,300,000 of short-term notes were issued instead. The proceeds from the bond issue will be used to pay off these notes and to provide funds for improvements and betterments.

The statement of the assets and liabilities of the Kenyon-Rosing Machinery Co., Minneapolis, Minn., show that unsecured claims amount to $405,284, and the secured claims to $89,556. The assets amount to $410,000.

SHEET METAL PERFORATING PRESS.

For perforating very heavy sheets or where but a small quantity of any one kind of work is required it does not generally pay to make dies the entire width of the sheet, as in the case of such dies as are employed in large double crank presses for finishing a whole sheet at a single operation. A double crank press of the latter type was illustrated in *The Iron Trade Review* of Jan. 9, 1905. The machine now presented is especially designed for the work of a heavy jobbing press for sheet metal cutting.

The sheet is clamped on an accurately sliding table. This is automatically fed under the slide which carries from one to fifty punches according to the design or quantity of perforations to be cut. The table has automatic feeds and a quick return motion. The operator is within easy reach of all levers and adjusting wheels and has perfect control over every movement of the press. The machine as illustrated is arranged to punch two one-inch holes in ¾ in. iron and will of course do the equivalent of this work in the case of smaller holes, etc.

The press has a 2 in. stroke and has a four jaw clutch on the main gear. A friction clutch on the shaft operates the feeding mechanism on the table in front of the press. The pinion which meshes into the main gear is on an independent shaft having two gears of different sizes. Parallel to this shaft is another one carrying the flywheel and the tight and loose pulleys. On the latter shaft are two loose gears bolted together, each having a jaw clutch. These gears have a shifter collar connecting with a lever and the smaller gear may be put in mesh with the large gear on the other shaft or the larger gear can be meshed with the smaller. But one pair only can be put in mesh at a time. The gearing is so arranged that with one set of gears in mesh, the velocity ratio between the two shafts will be 8.8 to 1, while with the other set of gears in mesh the velocity ratio will be 4.4 to 1. The shaft with the tight and loose pulleys runs at 350 r. p. m. The gearing permits a quick change from one speed ratio to another without removing any parts of the machine.

The main shaft of the press is 7 in. diameter. The height of the throat is 16 in. The height from the floor line to top of the main gear is 100 in. The feed rack is 13 ft. 6 in. long. The ways are 27 ft. long and in the case of the machine here illustrated were made to carry plates ¾ x 60 x 144 in. The net weight of the press is approximately 25,000 lb. and the machine was built by the E. W. Bliss Co., of Brooklyn, N. Y.

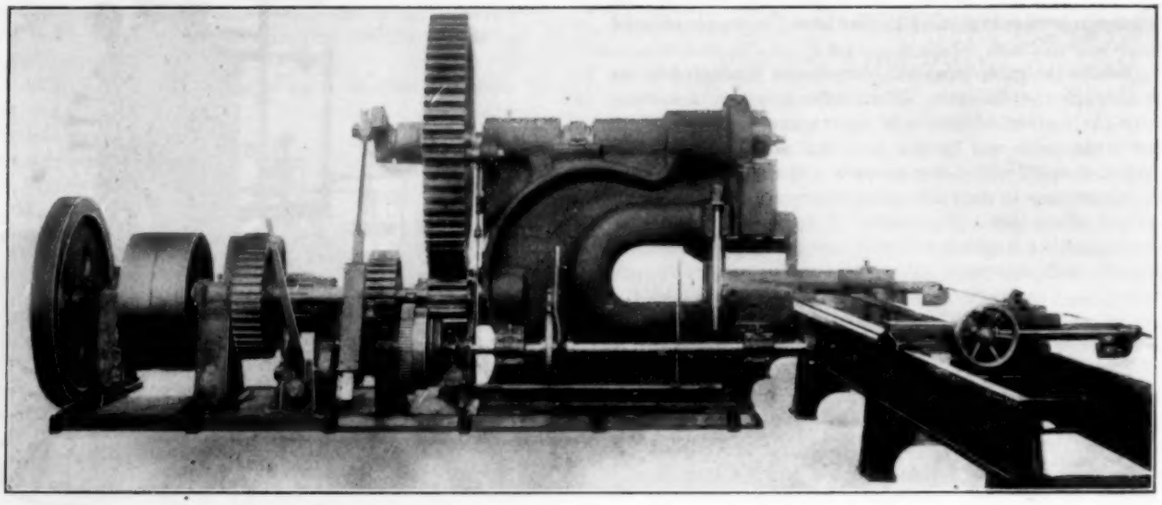


FIG. 1.—JOBBING PRESS FOR HANDLING HEAVY SHEET METAL.

THE FUEL-TESTING PLANT AT ST. LOUIS.*

Among the Government exhibits at the Louisiana Purchase Exposition none has attracted more attention among engineers and technical men generally than the fuel-testing plant of the United States Geological Survey. The expense involved in the construction and operation of the plant were defrayed from two appropriations, of $30,000 each, made during the latter part of the session of Congress ending April 28, 1904. The law provided for the analyzing and testing of the coals and lignites of the United States to determine the most economical method for their utilization, but stipulated that all of the testing machinery and all of the coals and lignites to be tested should be furnished to the Government free of charge. For carrying out the provisions of this act the Director of the Geological Survey appointed Edward W. Parker, chairman; Joseph A. Holmes and Marius R. Campbell to direct the construction and operation of the plant. Considerable delay was occasioned by the provision that all of the testing machinery should be furnished free. A further delay was caused by a strike at the works of the Link Belt Machinery Co., of Chicago, on machinery obtained from that company. Owing to these causes the plant was not put in operation until Sept. 1. The plant as completed contains the following equipment, which has been furnished free of charge:

Two Heine water-tube boilers, 210 h. p. each, contributed by the Heine Safety Boiler Co., of New York and St. Louis. One Allis Corliss engine, contributed by the Allis-Chalmers Co., of New York and Chicago. The Corliss engine is belt-connected to a Bullock electric generator contributed by the Bullock Electric Mfg. Co., of Cincinnati. One Frost fire-tube boiler of 100 h. p. and a 50-h. p. slide-valve engine, both contributed by the Frost Engine Co., of Galesburg, Ill. One Taylor gas producer, with complete outfit for scrubbing and purifying gas, contributed by R. D. Wood & Co., of Philadelphia. One Westinghouse gas engine, of 235 brake h. p., furnished by the Westinghouse Machine Co., of Pittsburg, and operated by the gas made in the Taylor producer. One Westinghouse electric generator, belt-connected to the gas engine, contributed by the Westinghouse Electric & Mfg. Co., of Pittsburg. Seven motors of different horse power, required for the operation of the different portions of the plant, contributed by the Westinghouse Electric & Mfg. Co. One Bartlett direct-heat rotating dryer for driving out the moisture

*From a recent report of the United States Geological Survey, Chas. D. Walcott, director.

from the washed coals and the lignites whose moisture contents are too high to permit successful briquetting, contributed by the C. O. Bartlett & Snow Co., of Cleveland. Two briquetting plants—one exhibited by William Johnson & Sons, of Leeds, England, and one by the American Compressed Fuel Co., of Chicago. In order that the briquetting machine of British manufacture should be installed in conformity with the law, the freight bill was paid by the Western Coal and Mining Co., of St. Louis. A washing plant equipped with a New Century jig, contributed by the American Concentrator Co., of Joplin, Mo., and a modified Stewart jig, contributed by the Link Belt Machinery Co., of Chicago. The fire brick and common brick used in the construction of the coke ovens were donated by the Laclede Fire Brick Mfg. Co., of St. Louis.

The foregoing statement includes all that might properly be considered testing machinery, but the following incidental equipment also has been contributed by the firms mentioned:

One Williams crusher, by the Williams Patent Crusher and Pulverizer Co., of St. Louis. A complete outfit of belt-conveying apparatus, contributed and installed by the Robins Conveying Belt Co., of New York. Scales, by Fairbanks, Morse & Co., of New York and Chicago. Smoke-preventing device, automatic steam jet, by H. H. Hughes, of St. Louis. Thermometers and pressure gauges, by the Hohmann & Maurer Mfg. Co., of Rochester, N. Y. Draft gauges, by the Appliance Mfg. Co., of Chicago. Feed-water heater and pump, by the Stilwell-Bierce, Smith-Vaile Co., of Cincinnati. Le Chatelier pyrometers, by Charles Engelhard, of New York. Engine indicators and attachments, by the Ashcroft Mfg. Co., of New York, and the Crosby Steam Gauge and Valve Co., of Chicago. Metallic piston packing, by the Steel Mill Packing Co., of Detroit, Mich. Burroughs adding machine, by the American Arithmometer Co., of St. Louis. Insulated electric wire, by the American Steel and Wire Co., of Chicago. Machine and engine oil for lubricating the machinery, and heavy and medium oil for binding material in the manufacture of briquettes from bituminous coals and lignites, by the Waters-Pierce Oil Co., of St. Louis. Oil filter, by the Famous Filter Co., of St. Louis. Gas meters, by the Pittsburg Meter Co., of Pittsburg. Dumping car and bucket conveyors, by the Austin Mfg. Co., of Chicago. Centrifugal pump, by Henion & Hubbell, of Chicago. Coal-tar pitch, from the Barrett Mfg. Co., of New York, and the Chatfield Mfg. Co., of Cincinnati. Power crusher and automatic sampler for preparing samples for the chemical laboratory, by the F. W. Braun Co., of Los Angeles, Cal. Cooking range, by the Buck Stove & Range Co., and a heating stove, by the Bridge & Beach Mfg. Co., both of St. Louis, for the purpose of testing briquettes for domestic use. Calculating machine, by the Keuffel & Esser Co., of New York.

The plans for the buildings and their arrangement were prepared by Roberts, Shaefer & Co., engineers, of Chicago. The construction work was done under the supervision of B. Frankboner, one of the engineers for Roberts, Shaefer & Co. Mr. Frankboner was accidentally killed by an electric locomotive early in October.

The railroad companies entering St. Louis, or having coal resources along their lines, have co-operated most heartily with the committee in charge of the work. The various portions of the plant have been put under the direction of men thoroughly equipped in their special lines. The boiler-test division has been under the direction of Prof. L. P. Breckenridge, of the University of Illinois, with Prof. D. T. Randall, of the same university, as chief assistant. The gas-producer tests are under the direction of Prof. Robert H. Fernald, of Washington University, St. Louis, assisted by Capt. John A. Laird, also of St. Louis, as consulting engineer. The operation of the gas producer has been directed by Messrs. Lummis and Nordensen, expert engineers, of R. D. Wood & Co., of Philadelphia. The gas engine operations has been looked after by J. G. Culbertson, one of the engineers of the Westinghouse Co. The washing operations have been under the superintendence of John D. Wick, of Chicago, general foreman of the plant. The coking plant has been in charge of Fred. W. Stammler, of Johnstown, Pa., assisted by B. B. Boyd, of

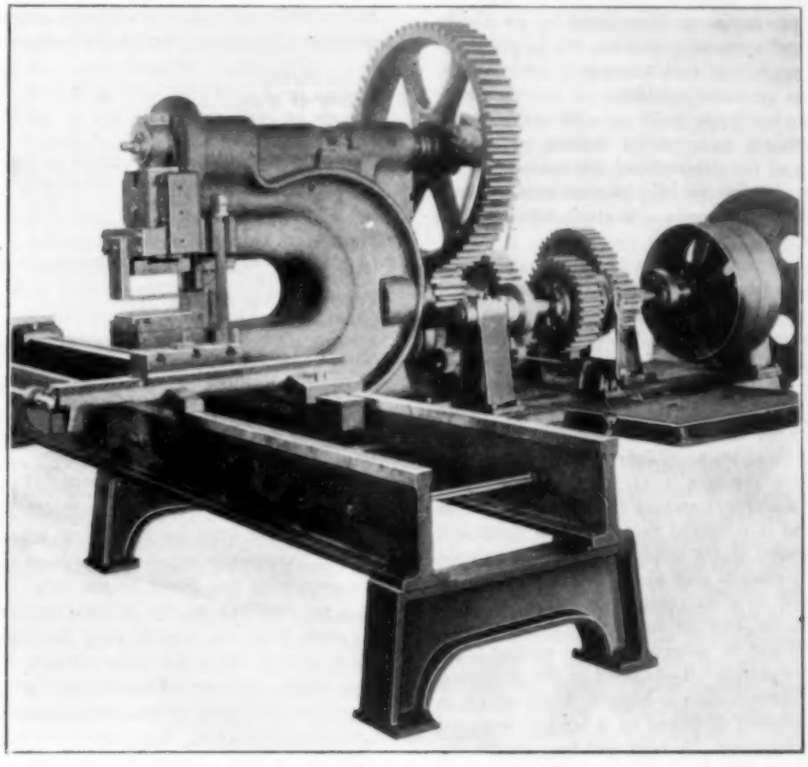


FIG. 2.—ANOTHER VIEW OF SHEET METAL PRESS.

Uniontown, Pa. The briquetting tests have been directed by Dr. Joseph Hyde Pratt, of the University of North Carolina and the United States Geological Survey, assisted by A. A. Steel. The plans for the chemical laboratory, its equipment and operations, have all been under the direction of Prof. N. W. Lord, of the Ohio State University. Professor Lord's work on the chemical composition of the coals of Ohio has placed him in the front rank of investigators in this line. He has had for his chief assistant at the coal-testing plant, E. E. Somermeier, who is also his chief assistant in his university work. The engine room has been in charge of Otto Kinner, a mechanical engineer, of St. Louis, and the electrical apparatus has been looked after by J. Underwood, also of St. Louis. The boiler room has been thoroughly equipped with standardized apparatus for weighing coal and water, for determining force of the draft, for ascertaining temperatures in different parts of the furnace, and for analyzing flue gases. The gas producer and gas engine have apparatus for ascertaining temperatures, for collecting samples of gas as produced, and for determining the horsepower developed in the gas engine. The electric horsepower developed by both the steam engine and the gas engine is ascertained by 20-minute readings of voltmeters and ammeters, and the electrical horsepower developed per pound of fuel consumed by the two different methods is thus accurately determined and recorded. The chemical laboratory has been fitted up with every necessary apparatus and chemical material for making proximate and ultimate analyses, and for determining the calorific value of the coal. The last is determined by a Mahler bomb calorimeter, and the observations are made in a room especially set aside for this purpose.

The field work was placed in charge of M. R. Campbell, one of the committee appointed by the Director of the Survey for the prosecution of this work. Mr. Campbell has had two, and sometimes three, assistants in the field. All of the coal shipped to the plant for testing, with the exception of a few carloads of slack or culm, has been collected under the supervision of one of these survey officials. This has been done in order to avoid any possibility of the criticism that selected coals have been subjected to these tests. When the coal is shipped the Survey representative samples it at some working face of the mine by cutting a uniform section from the roof to the floor. The coal obtained is collected in an oilcloth sheet and is pulverized and quartered down until a laboratory sample, weighing from 2½ to 3 pounds and about 1 quart in size, is obtained. This is placed in a galvanized-iron can, which is hermetically sealed and shipped to the chemical laboratory for analysis. When the car is unloaded at the testing plant what is known as a "car sample" is obtained in the following manner: The coal is thrown into a hopper, from which it passes through rolls and then is raised by a bucket conveyor to bins in the washery building. A man standing beside the conveying apparatus takes small shovelfuls from the conveyor buckets at frequent intervals. About 200 pounds from every car are taken in this way and sent to the laboratory, where the coal is pulverized, quartered down, and analyzed. Again, as this coal is distributed to different portions of the plant for testing, other samples are taken in a regular and uniform manner and sent to the laboratory for analysis. Such a series of coal analyses has never before been made in this country.

Up to Dec. 1, 64 carloads of coal had been received or were on the way to the coal-testing plants. Of these there were 2 from Alabama, 6 from Arkansas, 1 from Colorado, 6 from Illinois, 2 from Indiana, 6 from Indian Territory, 5 from Iowa, 5 from Kansas, 4 from Kentucky, 4 from Missouri, 1 from Montana, 2 from New Mexico, 2 (lignite) from North Dakota, 2 (1 anthracite culm and 1 bituminous) from Pennsylvania, 2 (lignite) from Texas, 12 from West Virginia, and 2 from Wyoming.

Boiler Room and Equipment.

The steam-generating plant is in a building constructed of corrugated iron nailed to a framework of wood. This building has a floor space of 42 ft. 9 in. by 54 ft., and is located about the middle of the United States Geological Survey property, convenient for the delivery of steam to the different points in the plant requiring it. The building is divided by a partition, the boilers being in one room, the engines and generators in the other. Within the boiler room are located the boilers and other apparatus making up a steam-generating equipment, the main items being two Heine safety water-tube boilers, each rated at 210 horsepower; one 100-horsepower Frost return fire-tube boiler; one 7 by 4½ by 10 inch Stilwell-Bierce, Smith-Vaile Company steam pump; one feed-water heater, also made by the Stilwell-Bierce, Smith-Vaile Company; water-weighing apparatus; coal-weighing apparatus, and all other apparatus for conducting boiler trials. Only the two Heine boilers have been used in the trials, the Frost boiler being used to supply steam to an engine operating the washery plant and to the briquetting plants and to the Department of Agriculture wood-preserving plant in the vicinity.

It is to be noted that the two Heine boilers have entirely separate settings, the purpose being to run trials on one boiler while the other was being completely overhauled and cleaned. The boilers are of the following dimensions:

Grate surface ..... square feet..	40.55
Width of grate ..... feet..	6.16
Length of grate ..... do..	6.58
Height of furnace ..... inches	.26
Approximate width of air spaces in grate ..... do..	.5
Proportion of air space to whole grate surface .... per cent..	44
Area of chimney ..... square feet..	7.67
Height of chimney above grate ..... feet..	113.25
Length of flue connecting chimney ..... feet, direct..	0
Kind of draft	Chimney.
Water-heating surface ..... square feet..	2,031
Outside diameter of shell ..... inches..	42.9
Length of shell (outside to outside of heads) .. feet..	21.6
Number of tubes	116
Diameter of tubes:	
Outside ..... inches..	3.5
Inside ..... do..	3.25
Length of tubes ..... feet..	17.87
Superheating surface ..... square feet..	0
Ratio of water-heating surface to grate surface ..... — to 1..	50.1

The boilers used for testing purposes are fed by means of 1¾-in. Pemberthy injectors, the feed-water pump being used for supplying the Frost boiler only. The feed-water heater is also auxiliary to the boiler-room equipment and entirely separate from the boilers used in trials. The testing equipment used in the boiler trials consists of water-weighing tanks and scales, coal-weighing car and scales, calorimeters, thermometers, and pyrometers, draft gauges, and gas-sampling and analyzing apparatus. The water-weighing tanks are located beside the boilers. There are four tanks in all, two large ones standing on the floor and two smaller ones on a platform above the others. The two larger ones are for storage purposes merely, and are fitted with rods attached to floats in order to determine the quantity of water in each tank by consulting the marking on calibrated scales. The tanks containing the water being weighed stand on platform scales, which rest upon a platform 4 ft. above the floor level of the boiler room, one for each of the two storage tanks. The weighing tanks have a capacity of approximately 634 lb. of water. Each storage tank has leading into it the suction pipe of one of the injectors, which is so piped that it can feed only one of the boilers. No other facility has been provided to feed water into the boilers. The coal-weighing scale platforms were set into the boiler-room floor to facilitate the moving and weighing of the coal car. The car has a capacity of approximately 1,200 lb. of bituminous coal. The flue temperatures are delineated by a special long-stem thermometer. In all other cases ordinary mercurial thermometers, to accommodate the range of temperature, are employed. A special brass thermometer cup is placed in the pipe carrying the water

entering the boiler. Draft readings are taken at any of the desired places by leading a small rubber tube from that opening to a draft gauge attached to the boiler wall at a convenient height for the observer. Ellison draft gauges are employed, the gauges themselves being carefully calibrated and securely fixed to the side of the boiler setting. A Schaeffer and Budenberg separating calorimeter is attached to a 6-in. vertical pipe leading from the steam space into steam mains. A ½-in. brass nipple is used for this purpose. A set of Ringelmann smoke charts is employed to ascertain smoke data.

The duration of each trial has been as nearly ten hours as possible, keeping in view only that at the beginning and the end of the tests the conditions of the fire should be as near alike as could be judged. Gas analyses have been frequently made by employing an Orsat apparatus. It is the object of these tests to make boiler trials and to burn various coals under some standard boiler, and under what might be called fair conditions. Usually but a single trial could be made with each coal. Before being used under the test boilers the coal tested is sometimes burned under the auxiliary boiler furnishing steam for the other processes previously stated. In all the trials an effort has been made to maintain the rated horsepower of the boilers in use. The tests have been made in accordance with the code of the American Society of Mechanical Engineers, and complete reports will be submitted at a later date covering the coals tested.

During the exposition period, in which the testing plant was in operation, 77 boiler tests were made. The first two of these were of 2 carloads of bituminous coal from Cambria County, Pa., prior to the receipt of any regular testing coal. These 2 carloads of coal were furnished in order that the boiler plant might be put into good running order, and while the tests were as thorough as any of the boiler-test work, the coal was not shipped under the regulations adopted for the official tests, nor were the mine samples secured for chemical analysis. The 75 official tests included coal received from 16 States, as follows:

Alabama, 3; Arkansas, 9; Colorado, 1; Illinois, 6; Indiana, 3; Indian Territory, 4; Iowa, 6; Kansas, 7; Kentucky, 5; Missouri, 8; New Mexico, 3; North Dakota (lignite), 1; Pennsylvania (anthracite culm, briquetted), 1; Pennsylvania (bituminous), 1; Texas (lignite), 1; West Virginia, 14; Wyoming, 2.

These 75 official tests included, in a number of instances, more than one test of a single carload of coal. In one or two instances a second run was made of certain coals, in order to check the results of the previous test. In five cases tests were made of washed coal, the results of which will be compared with the results of the tests made of the same coal unwashed. Twelve runs were made of briquettes made from slack coal, or from fine coal produced at the plant. In one instance the coal that was tested was first washed and then briquetted. The tests of briquetted coal included one of Pennsylvania anthracite culm mixed with a small percentage of bituminous coking coal and a binding material of coal-tar pitch.

Gas-Producing Tests.

On Sept. 1 the tests of the gas-producer division were placed in charge of Prof. Robert H. Fernald. During the month the construction of the plant and the detailed arrangements for carrying on the tests were completed. A competent crew, consisting of five operators and observers and two computers, was put through the preliminary training necessary for a thorough understanding of the work. This crew has been under the direct supervision of Capt. John A. Laird, who is in active charge of the operations of the plan during the period of the tests. The Wood gas producer used for the tests has been run under the personal supervision of an expert sent by R. D. Wood & Co., and the engine side has been closely watched by experts representing the Westinghouse interests. These gentlemen have been on the ground for some weeks, and have rendered valuable assistance in their respective departments. During the period in which the plant was being brought to the necessary state of completion for thorough testing the various instruments were calibrated, a part of this work being done at the Exposition headquarters of the Bureau of Standards of the United States Department of Commerce and Labor, thus insuring the highest degree of accuracy.

Under the plan adopted for the tests the quantity of gas produced from each coal has been carefully determined, and full reports have been made regarding quality, heating value, etc. For this purpose a special chemist is constantly employed to make calorimetric determinations and analyses of the gas. All the gas generated in the producer is consumed in a 3-cylinder, 235 brake-h. p. Westinghouse gas engine. The final reports will show the coal consumed per horsepower and other information of special value and interest on the commercial side.

From Oct. 3 to 8 a complete official gas-producer test was made on a noncoking bituminous coal from Indian Territory. The Wood gas producer, the Westinghouse 3-cylinder gas engine, and all the auxiliary apparatus necessary for the test were found in excellent working order and continued so throughout the run. The actual running time of the test was thirty-one hours. It was then determined to make two tests of thirty consecutive hours each week, one beginning Monday at 10 o'clock a. m. and ending Tuesday afternoon at 4 o'clock. The second test was started at 10 o'clock Thursday morning and was run continuously until 4 p. m. Friday. This allowed a continuous run of thirty hours for each test, with a "lay off" of two nights and one day after the first test and of two days and three nights after the second test. The rest was none too long after thirty hours of continuous duty. As a different coal was tested each time, the period between tests was required also for inspection, repairs, etc., and for the satisfactory change from one kind of coal used in the producer to another.

Throughout the initial run approximately 200 electrical horsepower was developed continuously. The gas generated was fairly uniform, and no trouble was experienced in the operation of the producer or the engine.

Up to Dec. 1, 15 tests had been made with the gas producer with gratifying results. Complete records were kept of all coal charged to the producer, the steam and water used, the power required to drive the appliances connected with the operation of the producer, the gas generated, and the power developed. Besides these records, readings of thermometers, pressure gauges, calorimeters, etc., were made every twenty minutes during the running time. From these readings complete deductions of the tests will be made.

Coking Tests.

The coke ovens, under the direction of Fred. W. Stammler, were fired up for the first time on Sept. 9, Kansas coals being used. The plant for coking tests consists of three beehive ovens, 12 ft. in diameter and 7 ft. high, the fire brick furnished free by the Laclede Fire Brick Co. Two of these ovens have been in use constantly since the work was started on the date mentioned. Tests have been made of coals from every section of the country whether they had been previously considered as coking coals or not. Coals were tested for coking as received, and if high in sulphur and ash the same coals were washed and then charged into the oven, accurate determinations being made as to the improvement, if any, shown in the coal and also in the coke by the washing process. Noncoking coals were also tested with an added mixture of pitch or coal tar, with results which encourage further investigations along the same line.

Briquetting Plants.

The operation of the briquetting plants has been most interesting, as it has shown that there are many problems in-

volved in this really pioneer work which require more careful study than is possible under the conditions under which these plants have been operated. As this is almost entirely pioneer work in the utilization of American coals, not only must each coal be carefully studied, but the character of the binder, the heats to which the material should be subjected, and the pressure to be placed upon the briquette, are all matters of individual research.

It was not until Sept. 23 that the plant of English manufacture was in condition for operation. Considerable difficulty was encountered with the binding material which had been provided for the purpose. This was coal-tar pitch furnished by the Barrett Mfg. Co. and was found to be rather too hard for the coals with which it was desired to use it and for the heat which it was possible to obtain in the steam-jacketed reservoir attached to the machine. After experimenting for a week it was found necessary to close down the plant for alterations and repairs. On Oct. 3 experimental work was begun on a cargo of pitch received from the Chatfield Mfg. Co. This pitch also was found to be too hard for successful use under existing conditions. After some laboratory experiments, however, those in charge of the work were able to ascertain what the physical qualities of the pitch should be for briquetting certain coals, and through the co-operation of both the Barrett and the Chatfield companies plentiful supplies of pitch suited for the purpose were received.

The plant installed by the National Compressed Fuel Co. was given a trial on Sept. 27, but mechanical difficulties developed which necessitated changes, and it was not until Oct. 10 that a successful run was made. This plant has the advantage of permitting tests to be made on small quantities of material, but the binder must be added in liquid form after being melted in the steam-jacketed tank. This limits its use to the more fusible binders, and has prevented any tests with the pitch now on hand.

The principal work of the briquetting division was of an experimental nature. During the time the plants were in operation 11 runs were made on briquetting tests which were practical successes, and the briquettes were later tested in the boiler room. Six others were successful laboratory tests, but no runs were made on them. In some of these the results were satisfactory, but in most cases it was demonstrated that much more study will have to be given to the character of the coal, the binding material, etc., before a really successful commercial briquette can be made.

The Chemical Laboratory.

The chemical laboratory, under the immediate supervision of E. E. Somermeier, was in operation from Aug. 15 until Dec. 15. It became necessary on the latter date to close the laboratory on account of the intensely cold weather and of the fact that the building in which the laboratory is located was not suitably heated. A small amount of remaining work is being completed in the laboratory of the department of metallurgy of the Ohio State University.

During the time that the laboratory has been in operation a grand total of 597 samples for analysis have been received. Of this total, 114 were "mine samples," sent in by Mr. Campbell and his assistants while in the field supervising the shipments of the coal to be tested. These mine samples were received from the following States: Alabama, 4; Arkansas, 13; Colorado, 2; Illinois, 8; Indiana, 6; Indian Territory, 8; Iowa, 12; Kansas, 8; Kentucky, 10; Missouri, 6; New Mexico, 5; Texas, 4; West Virginia, 24; Wyoming, 4.

In addition to these there were 57 samples sent to this laboratory by officials of the Geological Survey from the following States: Alabama, 11; Arkansas, 4; Missouri, 2; New Mexico, 1; Pennsylvania, 16; West Virginia, 7; not classified, 16.

The samples received at the laboratory from the cars as unloaded at the coal-testing plant, and known as "car samples," numbered 62, distributed as follows: Alabama, 2; Arkansas, 5; Colorado, 1; Indiana, 2; Indian Territory, 5; Illinois, 6; Iowa, 5; Kansas, 5; Kentucky, 4; Missouri, 4; Montana, 1; New Mexico, 2; North Dakota, 2; Pennsylvania, 2; Texas, 2; West Virginia, 12; Wyoming, 2.

The samples analyzed in connection with the special tests made at the coal-testing plant amounted to 313. They are distributed by States as follows: Alabama, 13; Arkansas, 24; Colorado, 4; Illinois, 28; Indiana, 12; Indian Territory, 26; Iowa, 20; Kansas, 23; Kentucky, 21; Missouri, 28; Montana, 1; New Mexico, 10; North Dakota, 5; Pennsylvania, 8; Texas, 10; West Virginia, 73; Wyoming, 7.

In addition to the foregoing there have been 51 miscellaneous samples received for analysis. These include samples of coke made at the testing plant and pitches used for briquetting purposes. The number of determination made at this laboratory, including the analyses as enumerated above, reach a total of nearly 13,000. They include 175 ultimate analyses, 750 proximate analyses, 225 calorimeter determinations of heat values, 800 sulphur determinations, 150 nitrogen determinations, 60 determinations of phosphorus in ash, 150 specific gravity determinations on cokes, 500 determinations of losses on air drying, and 150 miscellaneous determinations.

Storage and Washery Building.

The building in which the washery and storage bins are located was designed to meet a variety of conditions. One of the prime factors was cheapness, for, as a large part of the equipment had to be obtained free of charge, it was necessary to reduce the machinery parts to the utmost. Another condition was that the machinery had to be used not only to wash the coal, but also to crush and distribute to the different parts of the plant the coal which was not intended to be washed before using. A third condition was that the coal, both before and after washing, and the refuse matter had to be weighed and temporarily stored. The coal is unloaded from the cars by hand, and if it is not already of small size it is passed through a set of rolls, reducing it to sizes of 1½-in. cubes or under, or it may be reduced further to ⅛ in. or under in a Williams mill. Extending entirely around this part of the building is a link-belt gravity-discharge elevator conveyor, which, passing under the rolls and crusher, takes the coal discharged from them and elevates it to the top of the building, where it is discharged into one of the four storage bins, into a raw coal bin, or into a revolving screen, as desired. Or the coal may be discharged from this conveyor direct to a system of Robins belt conveyors and sent to the boiler house, gas producer, coke ovens, dryer, or briquetting machines. Immediately in front of the raw-coal bin are a Stewart washing jig and a New Century drop-motion washing jig. The former is adapted for washing coal of 2 in. or smaller, and the latter for the very small sizes and slack coal. Gates are provided in front of the raw-coal bin, so that coal may be taken to either one or both jigs. Above the bins is placed a revolving screen having ⅜ in. round holes. The overrun from the screen is sent to the boiler house, to the gas producer, or to the Stewart jig, as desired, while the screenings are distributed to the coke ovens, to the briquetting plants, or to the New Century jig, all being done by the Robins belt conveyors with the least possible employment of labor. The washed coal from the jigs passes into a sludge tank, from which it is raised by bucket conveyors and discharged into any one of the four storage bins. The refuse from either jig passes to another elevator, from which it is discharged into a refuse bin. Underneath the bins is located a Fairbanks hopper scale into which the coal can be drawn from any bin by chutes, weighed and discharged again into the same elevator, and delivered to the bins or to any part of the plant. It will be seen from this that one machine is, by this method, designed to handle all the coal, washed or unwashed, through the various processes of weighing, storing, and delivering to

any part of the plant. A centrifugal pump, furnished by Henion & Hubbell, takes water from the sludge tank and circulates it through the washing processes, fresh water being supplied to take the place of that lost with the wet material. The whole plant, except the Williams mill, is driven by a Frost slide-valve steam engine. The Williams mill is operated by an electric motor.

American Iron & Steel Mfg. Co.

President J. H. Sternbergh, of the American Iron & Steel Mfg. Co., Lebanon, Pa., in his annual report says:

"In our line of manufactures the year 1904 has been characterized by a very conservative demand on the part of buyers and a correspondingly active competition for orders on the part of manufacturers resulting in an extremely low range of prices. Your company's sales in money value of all manufactured goods during 1904 were about 20 percent less than in 1903, notwithstanding the total tonnage sold in 1904 was a little greater than in 1903. An improvement, however, both in demand and in prices has lately appeared, and the prospects are for better business in 1905 than we realized in 1904. During a period of five or six months in 1904, about half of our machinery for the production of bolts, nuts, rivets, etc., was standing idle for want of orders. However, we have paid the regular quarterly dividends on our preferred stock amounting to $150,000, and have paid $157,161,86 for betterments and extensions, and have charged $50,000 to the reserve fund to provide for depreciation of buildings and machinery, and have written off the balance of $24,895.87 to our charter and organization account, and have added $46,625.15 to undivided profits, making the latter amount $290,829.27, as per statement on the opposite page. All things considered, we regard this as a very fair showing for an off-year. But this result could not have been attained except for the constant and faithful services of our principal officers, Mr. McLeod, Mr. Richards, Mr. Hallman, H. M. Sternbergh, Mr. Culliney, Mr. Hutchinson and others, to all of whom great credit is due.

"A call has been made by your board of directors of $2.50 per share on the 340,000 shares of our common stock payable February 28th next, with which we hope to pay off our note indebtedness and thus place our company in a more satisfactory financial condition. At the same time the common stock will be reduced from 340,000 shares to 51,000, and by the exchange of 6⅔ shares of the former for one of the latter will be made full paid at $50 per share, and thereafter non-assessable. The consummation of this project together with the work referred to in our second annual report of placing our plants in first-class physical condition completes the object the present administration has long had in view. The shareholders of the company may now therefore feel congratulated not only upon the excellent physical condition of the company's plants, but the prospective high financial condition of the company."

Charles M. Schwab, in being interviewed in regard to making a trip to Europe, said that he expected to go to Russia, but not at once. He said he did not know what would result from his visit to Russia, but he did not think that any one would be disposed to discuss business until conditions in that country settle down. When asked if he would affirm or deny the report that he was going to build a new navy for the czar, he said: "I can discuss nothing in that connection, but you must understand that everybody is looking toward Russia in a business way, and we are not a bit different from other people in that respect."

The Baltimore & Ohio Railroad Co. announces that it has contracted for 48,000 tons of steel rails. The order is divided as follows: Pennsylvania Steel Co., 13,000 tons; United States Steel Corporation, 25,000 tons; Cambria Steel Co., 10,000 tons.

SOME FEATURES OF AMERICAN PLANERS.*

BY ARCHIBALD KENDRICK.

Between this country and America there is a difference of conditions, which manifests itself all through the design and construction of a machine, from the general features down to the smallest detail. America is a huge developing country, with a large, ever-increasing and sure market for her goods; hence people are readier to specialize in one article than they are here. Likewise there is a greater demand for labor, and it commands a very high price. Therefore every effort is made to minimize labor. To effect this, in the case of machine tools, they must be made as far as possible automatically, which results in the manufacture of standard patterns. Buyers cannot afford to have their whims and caprices attended to; they must buy what they can get manufactured. Further, the tool in its turn when in use must take a minimum of human time in manipulation, and must not produce bad work, which wastes labor to rectify. Minimum of attention seems to come before maximum of output, as is seen when one casually glances at half-a-dozen automatic lathes under one operative. The lathes are working well within their power, evidently because they cannot be closely watched and nursed; whereas full value is got out of the man. Thus there are many

FIG. 1.
SECTION OF CROSS-SLIDE.

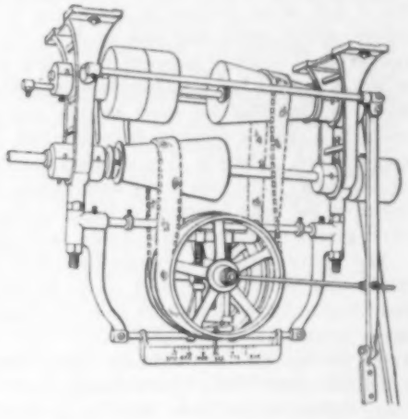


FIG. 2.
SPEED-CHANGING DEVICE.

instances of American firms specializing in one tool and adhering to standard patterns even in this. Great excellence of quality and refinement of detail is the result. But this state of things would no doubt tend to the ossification of ideas, if not more than counterbalanced by the spirit of enterprise bred in a great developing nation and enhanced by the exhilarating effect of their climate.

Several works where planing machines are made were visited by the author, and machines were seen in operation in many places. A Cincinnati firm afforded the best example of a factory where nothing but planers, and these of the most ordinary and useful sizes, were made. This firm was also the readiest in giving information. The machines seen in America were made of distinctly thin metal throughout; and the outside appearance was everything that could be desired. Better shapes can be given to castings if their models are kept standard and are not altered. In one works, to economize shop room, only the cross-slides, boxes, gearing, feed motion and other light parts were made to stock. The heavier parts were cast, and quickly got up when an order was received.

Beds mostly have the usual V's, planed, considerably more acute than 90 degrees, and are generally lubricated with rollers. The V has the advantage of requiring no setting-up slips,

* Read at meeting of the Institution of Mechanical Engineers, Jan. 20, 1905.

while flat ways are easier to lubricate, to get true on foundations and to keep true afterwards; all especially useful for long machines. Flat ways also are better for heavy work. In the large sizes many new machines were made with a guiding V on one side and a flat on the other.

Tables are furnished with longitudinal T-grooves and dog-holes at intervals. The Cincinnati firm find it better to drill these holes to jig instead of casting the usual square holes. This saves trouble with core prints, and gives the table a better surface to machine.

The cross-slides have a rectangular guide at the top with some sort of slip, and a V guide near the bottom, Fig. 1. American machines do not plane on the return stroke, and this arrangement forms a first-class support for the cutting stroke.

The drive is done in many different ways. The most usual one is by rack and pinion and spur gearing throughout up to the pulleys. At Cincinnati the pinion was of an unusually large diameter, having about thirty teeth. This was done to give a steady motion to the table. The pinion was, of course, well keyed to a short stout shaft.

At the end of the stroke, the table knockers, transmitting motion through levers and links, strike the belts. There are two of these, one for cutting and one for running back. Narrow single belts at very high velocities are used, to offer the least possible resistance to striking. The width of belt for a 3-ft. wide machine is about 1¼ in. For larger machines, spiral pinion and rack to drive the table is used extensively. The angle between the spiral shaft and the rack is not 45 degrees but considerably more acute, say 40 degree or less. At Cincinnati the shaft bearing and pinion oil-bath are made in a casting separate from the bed, for convenience of manufacture. Thereby they avoided having to bore the bed on the skew. The rack-teeth were milled, and the spiral was milled in the lathe. Both were made of cast iron. The pulley shaft geared up to the spiral pinion shaft with bevel wheels.

The pulley-shaft and countershaft were made exceedingly heavy and of best tool steel, so as to run very steadily, to bear evenly in the long cast iron bearings (which were not made to swivel), and to wear for a very long time. Pulleys keyed on to such shaft would never come loose with the roughest wear. The countershaft was run in cast iron long bushes, which were held in position in their hangers by running in babbitt in the annular space between the bush and the hanger. This was done when everything was in alignment.

All spur-gear was milled and all bevel gear planed, and every pair of wheels was run at the correct centres and angle in a special machine before assembling. By these precautions very smooth running was obtained. This was well shown by a glass of water placed on a moving table in which no ripple was visible, except at reversal.

Jigs are used for almost everything. The table and bed V's are each planed to jigs, and the result is so good that all that is necessary to finish is to scrape off the mark of tool. This does not apply to the cross-slide, which has to be got up more carefully. The bolt-holes to attach the arms to the bed and cross-head were drilled to templet; and the parts came together without a hitch. They stop only at drilling steady-pin holes to jig. The following is a remarkable example of the precision of their work:

The pulley-shaft had to fit its bearings and several fast-and-loose pulleys without any letting up afterwards. On its running surfaces two spiral oil grooves were cut in the lathe. These spirals were of opposite hands, and intersected at a certain point. An oil-hole was drilled in the bearings, and when the shaft was inserted the oil-hole always came opposite the desired point, which was the intersection of the two oil-grooves.

Some firms employ friction clutches in the drive instead of belt striking gear, especially for the larger machines. These are easier to throw than belts, and they give rise to less variation in the length of stroke. Still better results in this direction were obtained by a new device seen on an 8-ft. square machine, where at the points of reversal a cock opens admitting compressed air which blows the clutch across from one gear to the other. Friction-clutch machines are motor-driven very conveniently without a countershaft. Two other forms of drive were seen at Cleveland in which electricity played a prominent part in reversing. In one, an electro-magnetic clutch was pulled alternately to the direct and to the reverse gear. In the other, the knockers threw a switch which reversed the field magnetism and so the rotation of the motor, and also gave it a quick return speed. It was done by a new type of Westinghouse motor which was attached to one of their existing machines. This seems to be the most direct way of all.

In American planers a very high rate of speed is obtained on the quick run-back stroke, being about four or five times the cutting speed. But the cutting speed is nothing extraordinary, and the quick-cutting steels do not seem to have asserted themselves yet. When they do, they will raise the speed of the cutting stroke, but not that of the return, which is probably already as high as is feasible. The next step may be to run the machine at a constant high speed both strokes, and cut with double-cutting tool-holders. At present they do not seem to press the output of machines to their utmost limit, but, as in the case of the automatic lathes mentioned above, so with all but the largest planing machines, they prefer to have many, taking little attention, under one man. Nor are broad feeds supplied for quick finishing cuts. The simple pawl feed from a jumping rack at the side of the arm was used everywhere, and the momentum of the moving parts at reversal supplied the power to move the jumping rod. In several works where they wished to increase the output of existing machines, planers were run from a Reeve's variable speed countershaft, which gave great satisfaction. Where a few machines have to do a large variety of work differing in hardness and class, it is clearly an advantage to be able to vary the cutting speed. On hard stuff or in a cramped position it is desirable to run much slower than usual.

Another new speed-changing device was shown at the World's Fair. This was based on the familiar apparatus consisting of two cast iron taper cones geared together by a belt with forks to locate the belt and keep it from climbing. For the forks were substituted two guide-pulleys as shown in Fig. 2. This arrangement allows a good length of belt, and obviates the continual friction on the forks. The belt was a link belt (though it might have been a common belt), and was kept tight by springs acting on the guide pulleys. It worked well and had great driving power. A two-speed countershaft or a pair of stepped cones would no doubt serve nearly as well for this purpose.

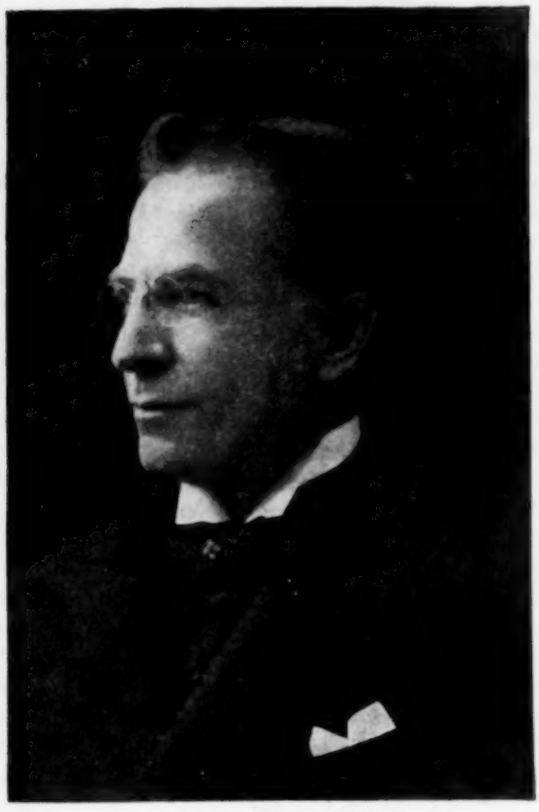
The cross-slide is commonly raised by a chain and wheel at the end of a horizontal shaft in the crosshead. In the larger machines a pulley is placed on the shaft, and in motor-driven machines a separate motor is used. In some very large machines motors were used for moving all the boxes as well.

The American Arithmometer Co. recently removed its offices and plant from St. Louis to Detroit, and has been reincorporated under the laws of Michigan, changing the name to the Burroughs Adding Machine Co., which is considered preferable from a commercial standpoint, and which will at the same time commemorate the name of William Seward Burroughs, the inventor of the machine which the company manufactures.

The Watt Mining Car Wheel Co., Barnesville, O., has issued a calendar giving views of its cars and of some important installations.

W. K. PIERCE.

W. K. Pierce is president and general manager of the Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y. The company manufactures steam and hot water boilers, radiators and sanitary supplies, with plants at Syracuse and Oswego, N. Y. This business was started nearly half a century ago by the father of Mr. Pierce, Mr. S. P. Pierce. The present company was organized in 1876 by S. P. Pierce, W. K. Pierce and William Allen Butler, under the firm name of Pierce, Butler & Pierce. They started in the gas and steam fitting business and in 1882 were incorporated under the present firm name, at which time they purchased the Catchpole Mfg. Co., of Geneva, N. Y. This company was the pioneer builder of the Florida boiler. With this venture, they launched into the business of steam and water heating and ventilation for buildings. The contracts taken during some ten years of this work represented the largest work of the kind in this country.



W. K. PIERCE.

With the removal of the plant from Geneva to Syracuse in 1891 the construction work was given up and the firm from that time on has been exclusively manufacturing and jobbing heating and sanitary apparatus and supplies. The improvement of the plant and product has been very rapid and today the firm makes the largest line of steam and hot water heating boilers, is the second largest manufacturer of steam and hot water radiators and the second largest manufacturer of sanitary apparatus. The company is at present building an enormous plant at Eastwood Heights, near Syracuse, for the manufacture of sanitary apparatus. When this plant is completed this company will, by manufacturing either directly or as manufacturers' distributers, represent all requirements in heating and sanitation of every description. The executive offices are located at Syracuse, N. Y. The principal branches are at New York, Boston, Philadelphia and Chicago. There are foreign branches throughout the civilized world.

In addition to the control and management of this business, Mr. Pierce is interested in several of the largest industrial corporations in his home city. His latest enterprise, in conjunction with other large Syracuse capitalists, is the organization of the Syracuse, Rochester and Eastern R. R. Co., which is building a through high-speed trolley line across New York State. Until recent years Mr. Pierce has devoted his entire time to his business interests and has refused many political offices. During the past presidential campaign he was induced to accept the nomination for Republican elector for his district. Mr. and Mrs. Pierce are now enroute for the far East where they will visit Hawaii, the Philippines, Japan, China and Hong Kong and expect to return in the early autumn.

Dimmick Pipe Co. Improvements.

The Dimmick Pipe Co., Birmingham, is preparing to make extensive improvements. It has just let contracts for building and machinery for a new shop. The building will be of steel construction and fire proof throughout. In its present shop it manufactures sizes ranging from 3 in. to 36 in. inclusive, and has a capacity of 175 tons of pipe per day. In shop No. 2 the company will manufacture sizes from 36 in. to 84 in. inclusive, and the combined tonnage of the two shops will be over 300 tons per day. By moving some of the larger sizes from the present shop (No. 1) to shop No. 2 the company will be able to increase its capacity on the smaller sizes. In building the new shop the company will introduce some new ideas in the way of labor-saving devices that will make it thoroughly up-to-date. It expects to manufacture pipe in this shop by not later than June 1 and will be prepared to undertake the contracts for all sizes. In addition to this the company has under contemplation extensive improvements in other departments of its plant and when these are completed it states that it will have the largest independent pipe plant in the country.

The capital stock of the company will be increased in order to take care of these improvements.

With the listing application to the New York Stock Exchange, the American Steel Foundries submitted the following balance sheet of the Simplex Railway Appliance Co., which was taken over recently by the Steel Foundries. The figures are of Nov. 30, 1904: Assets—Cash, $91,201; material on hand and in process of manufacture, $212,714; unexpired insurance premiums, $3,678; labor expense, $3,543; bills receivable, $52,581; accounts receivable, $384,656; accounts receivable, personal, $4,793; machinery, $182,476; less depreciation, $15,698; $166,778; patterns, $51,923; less depreciation, $13,064; $38,858; furniture and fixtures, $4,334; less depreciation, $289; $4,044; real estate and buildings, $135,672; laboratory equipment, $662; tools, $6,052; patent rights, $30,850; $382,919; total, $1,136,089. Liabilities—Accounts payable, $170,867; accounts payable, personal, $3,116; $173,984; capital stock authorized, $1,500,000; capital stock, issued and paid, $810,000; surplus account; January 1, 1904, balance, $158,554; increased this year, account sundry adjustments, by sum of $4,787; $163,341; less dividends; Jan. 13, 8 percent, $63,928; July 13, 4 percent, $32,204; Oct. 13, 6 percent, $48,306; $144,438; $18,903; surplus profits to Nov. 30, 1904, $133,101; total, $1,136,089.

A report from New York announces that Mr. Carnegie has in hand a biography of James Watt, which will probably be published during March. It will be remembered that Mr. Carnegie has taken an active part in the project of erecting a monument to Watt.

The Kinnear Pressed Radiator Co., incorporated with a capital of $400,000, will build a radiator plant at West Pittsburg, near Pittsburg, Pa. The plant will be 120 x 600 ft. and will have a capacity of 8,000 sq. ft. of radiator per day.

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FEBRUARY 16, 1905

THE OUTPUT LIMIT QUESTION.

The vexed question of limit of output in tin mills recently came to the front again, the scene of the latest trouble being the Wheeling district. From statements which are probably authentic it is gathered that the management of an independent mill in that district insisted that the output limit is being disregarded in nearby mills of the leading interest, and accordingly asked its men to disregard the limit also. The men, while inclined to admit the point, considered whether it was best for them to accept the condition without further parley, or use their constitutional prerogative in an effort to have conditions made uniform. They have no means of determining in advance whether a thorough threshing out of the matter in Amalgamated circles would result in bringing the alleged offenders in the other mills down to the limit or in removing the limit everywhere.

It is impossible to arrive at any conclusion as to the extent to which the output limit is being violated, but it is certain that there are now, and very frequently have been, flagrant violations. Secrecy is maintained where possible, but when a workman is discharged he usually attributes his discharge, in a mill where he seeks or has gained employment, to his unwillingness to do as others were doing. He may have been discharged for a totally different reason, but it sounds well to give this as the cause. Nor is it to be supposed that managers and superintendents have never stretched a point in endeavoring to convince their men that "other people are doing it."

It is obvious from general considerations, and as evidenced by the present trouble at Wheeling, that the effort to maintain a limit to the output in tin mills is a source of wrangling and embitterment among the men. For years it has done much towards weakening the Amalgamated Association. It has been a real trouble. Possibly the troubles would be no less real which would confront the organization were the limit of output removed, by lessening the number of jobs involved in making a given tonnage of tin plate, but it is greatly to be doubted. It is the universal observation of employers, and the universal testimony of capable labor leaders, that the greatest danger to organized labor lies within and not without its ranks. On this basis it would seem to be the wisest course on the part of the Amalgamated Association to remove this fruitful cause of discord, knit its organization tightly together, and then face squarely whatever conditions might arise from overproduction. That there is any real danger in this direction may be doubted. At this time, months before the most active season for the actual consumption of tin plate has begun, substantially all the tin mills of the leading interest, and very nearly all the tin mills of the independents, except a few which have not been financed, are in full operation, and have been for a month. At many of them the limit of output is now being exceeded, and if stocks are being accumulated, they are being piled up by those who firmly believe, whether rightly or wrongly, that the product will be needed in the coming season. Never in the history of the American tin plate industry have so many tin mills been in operation, and of course the actual current rate of production has never been even closely approximated. The production of tin plate in 1903 broke all previous records by 80,000 tons, last year established another new record and the current year will be in all probability do the same, bringing the production of tin plate to a quantity almost double that which was produced in the first year in which the American tin plate industry succeeded in supplying substantially all the domestic demand, some seven years ago.

The leading interest, from its very constitution, occupies a unique and most favorable position on the output limit question. Its general management signs the scale calling for a limit of output. Its managers and superintendents are in direct charge of the individual mills. The general office instructs them not to exceed the limit: to observe all scale requirements. At the same time it pits them against each other in a grand struggle for the lowest cost of production. The record is obtained by the simple arithmetical process of dividing the total cost by the total number of units produced; the quotient is the cost per unit. Is the manager of his own volition disposed to restrain the men from making more than the limit? Is the company disposed to dispense with his services if he permits it? The scale which is signed contains no requirement on either of these points. The men themselves, besides being perhaps a trifle credulous of statements as to what others are doing, know quite well that there are times in the year when mills of the company are closed for long periods, and that the selection of the mills to be closed is made with scarcely any consideration but a scrutiny of the list of operating costs. Can any reason be adduced why the company should follow any other course in its selection?

If the Amalgamated Association seeks to encourage the erection of new mills, with no more employment but more places to hunt it in, with sharper competition among manufacturers and lower prices for the product directly encouraging efforts to reduce wages, if it desires to encourage the designing and erection of mills intended to avoid the employment of its labor, if it strives to encourage discord in its own ranks, then it is its plain course to avoid the present issue. If it aims to restrain the creation of surplus capacity, to see the cost of production decreased without prejudice to the earnings of its members, and to strengthen its organization, it should throw down the half rotten bars it has been weakly endeavoring to maintain.

TERMINAL RAILROADS.

In the movement for additional railroad legislation on the part of the Federal government, it is somewhat strange that so little attention has been paid to the matter of terminal railroads. The terminal railroad industry was born so soon after the passage of the interstate commerce act in 1887 that it is substantially as old as that act. It did not take long for the conclusion to be reached that the operation of a terminal railroad and the acts of ordinary common carriers arising therefrom did not come within the ban of the act. No notice seems to have been taken of the great terminal railroad industry beyond periodic discoveries of "a new method of beating the railroads" as heralded now and then in the public prints and then forgotten. The Interstate Commerce Commission seems never to have been in doubt on the subject.

There are few points on which the ordinary shipper would be more desirous of additional legislation, if personally appealed to, than on the subject of terminal railroads. There are, of course, complaints in regard to inadequate car supply, but the first paragraph of Section 3 of the interstate commerce act makes an effort to cover this point and with proper diligence can be made to cover any real and lasting hardship.

Nothing appears to have been brought out on the subject of terminal railroads by direct testimony beyond the spasmodic investigations of the Interstate Commerce Commission itself, as, for instance, the case developed in Chicago last May where a mere siding was used as an instrument to obtain a division of 80 percent of the freight charge to the Missouri river. It would appear that in this particular case, the investigation was undertaken rather at the instance of the railroad which had thus allowed itself to be deprived of the greater part of its revenue, than at the instance of any competitor of the shipper. The ordinary shipper who knows that his larger and more powerful neighbor or competitor has an advantage over him through the operation of a terminal railroad does not seem to be heard from.

A careful study of Section 2 of the interstate commerce act would indicate to the lay mind that the only loophole by which the terminal railroad device escapes the law is that it is a corporation separate and distinct, legally, from the corporation or other organization which carries on the business to which it is geographically attached. The very elaborateness of the organization of the railroad, as compared with its property, embracing sometimes but a fraction of a mile of track, with no respectable rolling stock, should cause curiosity and invite investigation. Were the officers of a trunk line found to be the active managers of a manufacturing or other business located on the line, the circumstance would surely attract notice.

It does not matter that, in the majority of instances, the division between the real railroad and the terminal railroad is on the surface an equitable one. If the railroad can spare the portion it gives to the terminal railroad, then its charge to others, receiving no share, is more than it should be. If the work done by the terminal railroad merits payment, then why not make a case of discrimination in favor of the interest which maintains no terminal railway? The reports presented by the terminal railroads do not show large profits, while they do show enormous earnings per mile. Obviously they perform shifting operations and various other services for the business to which they are really connected, for which no charge is made, and it is probably fair to assume that they pay salaries to offices which are far in excess of the actual services rendered.

The terminal railroad as now operated is wrong in principle and in practice works a discrimination which the framers of the interstate commerce law intended to make impossible. The great majority of existing terminal railroads should be legislated out of existence and the remainder should be closely regulated.

The men who, after being on a prolonged strike at a Kentucky foundry, purchased the plant, have announced that every employe, from the president to the least skilled molder, shall receive $3 per day. This is the union scale and the policy carries the union principle to an absurd but logical extreme. It is a striking illustration of the tendency of labor unions to refuse recognition to merit and place all men, regardless of their ability, on the same dead level of mediocrity. A more successful plan for discouraging ambition could not be devised.

The Interstate Engineering Co., Bedford, O., held its annual meeting February 9. The annual report was presented. Business in general during the past year was considered satisfactory. The board of directors was increased from five to seven members, who are: C. A. Klump, R. W. Kaltenbach, Justin Griess Jr., Cleveland; Paul Schneider, Bedford; Ernest Griess and Albert Capelle, Cincinnati, and E. J. Kaltenbach, New York. The officers elected for the ensuing year are: C. A. Klump, president; R. W. Kaltenbach, vice-president; Albert Capelle, secretary; Justin Griess Jr., treasurer.

Clark's rolling mills at 35th street and Allegheny Valley Railroad, Pittsburg, were damaged by fire to the extent of $5,000.

The Labor Situation.

CINCINNATI METAL TRADES DINNER.

The quarterly meeting and dinner of the Cincinnati Metal Trades' Association was held at the Business Men's Club on Thursday evening, Feb. 9. Mr. Wm. Lodge, of the Lodge & Shipley Machine Tool Co., presided as chairman and toastmaster. The first speaker introduced was Rev. Robert B. Nelson, of Newport, Ky. Mr. Nelson followed no announced subject. His address was along the line of the application of the Golden Rule in business affairs in the relation of competitive interests and the relation of employer to employe. He argued that the survival of the fittest plan of procedure was but the exemplification of the animal side of the individual, while the intellectual and ethical side was typified in the application of the Golden Rule. He held that all men's interests were identical and that the brotherhood of man made the application of the Golden Rule practical in business affairs. At the close of Mr. Nelson's address, a motion was made and carried that he be requested to regard himself as a regular speaker at these quarterly dinners.

The next speaker introduced was Mr. J. M. Manley, the newly appointed assistant secretary of the association. In introducing Mr. Manley, Mr. Lodge stated that the association had felt for some time that there had been a laxity in keeping track of employes in the shops and of learning their value to their employers and their adaptability to certain kinds of work or special proficiencies. For this reason the association had determined to secure high-class service for the accomplishment of this purpose, and it was believed that Mr. Manley would meet the requirements. Mr. Manley began his address by thanking the association for the honor conferred on him and asking for assistance and co-operation from the membership, in order that the objects desired might be fully realized. He expressed the wish to become acquainted with the men in the shops who employed the help, as it would be with these men that he would have the most contact. It was announced that as soon as the new offices in the Masonic Temple were completely furnished an informal reception would be arranged for and that he would be glad to have the members call upon him as frequently as convenient, and he wanted them to feel at home in his office. The purpose and aim of the association were discussed by him at length. He stated that the association was established to bring about better understandings between employers and employes, but was also ready to champion the interests of the members in reference to transportation facilities and in combating discriminations in railroad rates. He stated that much could be accomplished in this way through the organization, and that organization was necessary to promote concerted action along these lines. He declared that a spirit of fairness and right dealing actuated the association and its membership as individuals, and with such a standard there must be progress. He said that the association's attitude toward the working man was to ask nothing from him that it would not expect to render if the positions of employer and employe were reversed. The association, he maintained, stood for liberty of thought and action. Mr. Manley closed his address with the quotation, "To thine own self be true, and it must follow as the night the day, thou canst not then be false to any man." At the close of Mr. Manley's address Mr. F. A. Geier, of the Cincinnati Milling Machine Co., addressed the chair and asked permission to state that he believed the association was to be congratulated upon securing Mr. Manley as its executive. If the association in the past, he said, had not quite succeeded in some features of usefulness, he believed that now, with such a man in its employ as Mr. Manley, the best hopes for the full success of the association's objects would be attained. He further urged that the co-operation and assistance of the members of the association be given the new assistant secretary.

Mr. Lodge here introduced his business partner, Mr. Shipley, who spoke of the attitude of employers toward old and efficient employes. He related an account of a visit to the Brown & Sharpe plant at Providence, R. I., and his meeting there its superintendent, Mr. Richmond Viall. Mr. Viall has been in the employ of this company for about forty years, and has been superintendent for twenty-five years. On the twenty-fifth anniversary of his superintendency, the company sent Mr. Viall a congratulatory communication, at the same time advising him that so long as he lived his position was assured to him, and that no other should occupy that position with the company. Mr. Shipley continued further, speaking of Mr. Viall's attitude toward his shop foremen and employes, relating an incident to the effect that on a certain occasion Mr. Viall was much annoyed at something one of the shop foremen had done, and took him to task quite severely in the presence of his men. After the incident had occurred and Mr. Viall had returned to his office, he realized that he had been hasty and had unnecessarily embarrassed the foreman by his remarks, especially in the presence of his workmen. He accordingly sent for the foremen and his men to come to him and apologized for his action, frankly admitting his error, and stating that his criticism should have been made to the foreman alone. It was moved by Mr. Shipley that Mr. Viall be invited to make a visit to Cincinnati and be the guest of the Cincinnati Metal Trades Association, which motion was carried.

The next speaker was Mr. Robert Wuest, Secretary of the National Metal Trades Association. Mr. Wuest stated that during his stay in Chicago during the machinists' strike, he had noted the formation of the Superintendents' and Foremen's Club in that city composed of the superintendents and foremen of the various machine shops. The club was formed for the exchange of ideas on shop method and management and had proven of great benefit to the men and their employers. The value of the club stimulated interest in the work and the closer studying of shop management, and the reading of papers on various topics had stimulated discussions which had brought much light upon the subjects under consideration Mr. Wuest urged that a similar club be formed in Cincinnati. A number of shop foremen and superintendents were present at the dinner and listened to Mr. Wuest's remarks with careful attention, and it is practically assured that such a club will be formed.

Commissioner Eagan followed Mr. Wuest and stated that the shop foremen and superintendents were men who had stepped out from the ranks, and whose interests were identical with those of the employer. They were men no longer in the attitude of the rank and file of employes, and had no further use for the union card. If there exists a dividing line between employer and employe, the shop foremen and superintendents were on the side of the employer. Continuing his reference to the Chicago club, he stated that professors of educational institutions were anxious to attend the meetings of the club and to engage in the discussion of the papers. The educator recognized that he was a theorist and that contact with men of actual experience would be valuable, and in order to secure this contact and this privilege the educational institutions offered the club members the use of their laboratories and facilities of their institutions for the working out of ideas, and, in other words, the professors were anxious to exchange the benefits of their theoretical knowledge for the knowledge obtained by men of practical experience. The value of such educational advantage, said Mr. Eagan, must appeal to the intelligence of any one, and such a club ought to thrive and be a success.

The following is a list of those present:

Wm. Lodge and Murray Shipley, Lodge & Shipley Machine Tool Co.
Charles F. Waltz, Employers Association.
Jos. D. Morten, *The Iron Trade Review.*

Will L. Finch, Cincinnati Industrial Bureau.
F. R. Lindsley, *Iron Age*.
Herbert L. Beeler and A. C. Hoeffinghoff, Bickford Drill & Tool Co.
W. P. Dolle, National Machine Tool Co.
Wm. Peters and Wm. Bartels, Bickford Machine Tool Co.
L. F. Rechtin and Louis E. Rechtin, L. E. Rechtin & Bro.
C. R. Gabriel, Chas. S. Gingrich, J. H. Cone, J. Craig, George Dell and C. W. Siehe, Cincinnati Milling Machine Co.
Emil VonWyck, VonWyck Machine Tool Co.
C. E. Beall, R. K. LeBlond M. T. Co.
C. E. Greenwald and T. L. Greenwald, I. & E. Greenwald Co.
G. F. Ahrens and Chas. F. Fox, The Ahrens Fire Engine Co.
A. H. Tuechter and S. C. Schauer, Cincinnati Machine Tool Co.
J. Hartzel, J. Hartman, J. C. Pflanzer, R. A. Baker, W. Siebert and R. K. LeBlond, LeBlond Machine Tool Co.
F. Holz, Cincinnati Milling Machine Co.
John F. Hettich, LeBlond Machine Tool Co.
O. H. Broxterman, John Steptoe Shaper Co.
C. C. Milhill, W. H. Underwood. A. Underwood, C. W. Moon and C. S. Reno, Triumph Elec. Co.
J. E. Hirst and L. G. Robinson, J. A. Fay & Egan Co.
John G. Stuhlfauth, H. S. McClellan and D. Bryne, Lodge & Shipley M. T. Co.
John M. Neil, Jno. H. McGowan Co.
S. P. Egan, J. A. Fay & Egan Co.
L. G. Keck, Bickford Drill & Tool Co.
Wm. P. Tuechter, The Chambers Machine Co.
Wm. H. Behlendorf Jr., Eureka Ins. Co.
John N. Roberts, U. S. Government.
Henry L. Korb, Eagle Litho. Co.
Walter H. Geier, The Miller Jewelry Co.
W. H. Burtner, Jr., The Barker & Chard Mach. Tool Co.
J. B. Doan, The American Tool Works Co.
B. B. Quillen, The Cincinnati Planer Co.
A. E. Robinson, The American Tool Works Co.
Geo. Laugen, The Cincinnati Planer Co.
J. M. Manley, Asst. Secy. Cincinnati Metal Trades Assn.
Fred A. Geier, Cincinnati Milling Machine Co.
Rev. Robt. B. Nelson.
Robert Wuest, National Metal Trades Assn.
G. A. Willard, Williard Machine & Tool Co.
Samuel Moyer, The Lunkenheimer Co.
H. C. Hoeffinghoff and H. M. Norris, The Bickford Drill & Tool Co.
W. P. Egan, The National Metal Trades Assn.
Phillip Fosdick, The Fosdick Machine Tool Co.
P. G. March, The Cincinnati Shaper Co.
Benj. Sebastian and Jacob May, The Sebastian Lathe Co.
V. E. Tresise, Ohio Pattern Works.
Chas. Reedy, Reedy Elev. Co.
Isador Rauh, The Cincinnati Electrical Tool Co.
H. Ritter, The Lunkenheimer Co.
David C. Jones, The Lunkenheimer Co.
Kessler Smith, Philadelphia Steel & Iron Co.
H. G. Frech, Cincinnati Metal Trades Assn.
C. R. Houston and C. F. Houston, Houston, Stanwood & Gamble Co.
W. H. Bevis, Edw. Kountz, H. H. Matheiser and A. R. Murray, Cincinnati Shaper Co.
Park Stewart, John A. Stewart Electric Co.
R. E. Laidlaw and Walter Laidlaw, Laidlaw-Dunn-Gordon Co.
Wm. Herman, The Fosdick Machine Tool Co.

METAL TRADES ASSOCIATION NOTES.

The polishers in the employ of S. L. Allen & Co., of Philadelphia, have gone on strike on account of the premium system being introduced. Steps have been taken to fill the shop with other men.

The regular monthly meeting of the New York Metal Trades Association is called for March 9, at 2:30 P. M. at the rooms of the association.

The club of the foremen and superintendents in the employ of the Metal Trades Association members of Chicago will meet Saturday evening, Feb. 18, at the Sherman House. The meeting will be preceded by a dinner, followed by a social entertainment.

Mr. W. P. Eagan, commissioner of the National Metal Trades Association, leaves for Washington on the 15th to attend the meeting of the plan and scope committee, which will be held in that city on the 17th and 18th.

It is now assured that the alumni dinner feature of the N. M. T. A. will be a success. The ex-officers and ex-members of the administrative council of the association have responded heartily to the suggestion and the dinner has been arranged to take place on the evening preceding the Chicago convention.

LABOR NOTES.

The Philadelphia Association of Bridge and Structural Iron Workers and their employers have signed an agreement for one year. For some time there have been differences between the contractors and structural iron workers resulting in strikes and hampering the work on big operations.

Two bills, said to be endorsed by the Denver Citizens' alliance, have been introduced in the Colorado legislature. One, intended to prevent boycotting, prohibits the distribution of unfair lists, with a penalty of $250 to $500 fine or 60 days' imprisonment for violation of the law. The other bill requires that labor unions shall be incorporated and that certified copies of the minutes of union meetings furnished on request to corporations employing members of such unions. The bill also provides that any agent of an incorporated union who attempts to act for the union may be arrested for misdemeanor.

Twenty-one suits, amounting to $147,000, have been filed in the county court at Tuscaloosa, Ala., by the non-union miners against the United Iron Workers of America and the local union for damages, because they claim they were turned out of their homes and deprived of the necessities of life by the union.

The judiciary committee of the national house has, by a vote of seven to four, indefinitely postponed the making of a report on the Grosvenor anti-injunction bill. Two members of the committee who were said to be opposed to the measure were sick at their homes, or the vote would have been even more decisive. The new Jenkins anti-injunction bill was placed in the hands of a sub-committee, and it may be stated with a reasonable degree of assurance that no report on any anti-injunction bill is now possible at this session.

During the St. Louis livery strike on Feb. 22, 1904, Nasil Rutherford, a non-union carriage driver, was assaulted by Ernest Ruck and others. Ruck was arrested a month later and made a confession to the chief of detectives, in which he stated that he with Michael J. Ryan and William Kelley were each paid $6.50 a day by William Rowbotham, the treasurer of the International Brotherhood of Teamsters to assault non-union drivers, and had been sent to St. Louis from Chicago for that purpose. Ruck was tried by a jury and convicted on Jan. 21 on the charge of assault to kill and his punishment was fixed at two years.

Boiler makers to the number of 100 left their work in the shops of the New York, New Haven & Hartford railroad at New Haven, Feb. 8. The trouble is said to have been originated in the appointment of a new foreman.

A remarkable condition under state arbitration has developed in the Newcastle collieries, New South Wales, where 4,000 men are idle on account of the strike of coal wheelers. The New South Wales arbitration court ordered all men affected by the previous award of the court to return to work. The order has been defied and the attorney general has obtained leave from the court to prosecute those who disobey the order. The leader of the strike declares that it will be impossible to put the whole country in jail.

The International Association of Bridge & Structural Iron Workers has decided to abolish the working card system of identification of members and adopt the stamp system.

About 100 molders in the foundries of the Joplin, Mo., district are out on a strike. Eight foundries in Joplin and a number in Webb City and Carthage are affected. Molders asked for a reduction in hours, which was rejected. They also want an advance in wages.

The first break in the ranks of the union workmen in the fight between the Builders' Exchange league and the labor organizations of Allegheny county, Pa., occurred Saturday when the National Association of Steam and Hot Water Fitters and Helpers of America signed the agreement prepared by the

league. Representatives of the manufacturers of steam and hot water appliances met a delegation of union men and the workmen practically agreed to the rules adopted by the league, though a slight change was made in rule 4. The original text of the article reads: "No agreement shall be entered into that will deny any man the right of employment," to which was added, "provided the said party shall become a party to this agreement." The executive board of the league ratified the agreement and the men have returned to work.

Brown & Sharpe Standards of Length.

The standard yard was first legalized in England, in 1824; this standard, however, was destroyed in 1834. The standard Imperial yard, "Bronze No. 1," was then prepared and legalized in 1855. Forty copies were made and one of these, "Bronze No. 11," was presented to the United States by the British government in 1856. At the same time another copy, known as "Low Moor Iron No. 57," was sent. These were accurately compared, before being sent, with the standard Imperial yard and the record of the variations sent with them. Although the constitution of the United States empowered congress to fix the standards of weights and measures, no legal standard of length was adopted until 1866, when a law was passed making the metre legal, the first and only measure of length legalized by the United States government. The Brown & Sharpe Mfg. Co. of Providence, R. I. prepared standards of length for use in its own shops and after their completion, they were compared by the government officials with the standards in Washington. The mean errors were found to be: For the yard .00002 in., and for the metre .000005 M., both being too long. The Brown & Sharpe Mfg. Co.'s standard yard has been subdivided into inches to a degree of accuracy much closer than is practicable for commercial reproduction. These subdivisions have not been compared with any government standard, in view of the fact that the comparison could not be made with any standard inch, the yard being the minimum.

Rapid Increase in Building.

According to reports made to *Construction News*, building in the principal cities for January shows a remarkable increase compared with the corresponding month a year ago. In twenty-seven of the leading cities permits were taken out for the construction of 5,187 buildings, involving a total cost of $24,964,651, against 4,317 buildings involving a total cost of $13,575,418 for the same month a year ago, an increase of 870 buildings and $11,389,233, or 83 percent. Over two-thirds of the cities enumerated show in some instances increases of remarkable magnitude. Nineteen out of the twenty-seven cities show increases varying from 21 to 887 percent. New York city shows an increase of 299 percent. Louisville's increase is the enormous percentage of 887; Indianapolis 528, Pittsburg 204, Cleveland 189, Allegheny 139, San Francisco 107. The other increases are below the 100 mark.

New Railroad Equipment.

The Southern railroad has ordered 75 locomotives from the Rogers works of the American Locomotive Co. The Atchison, Topeka & Santa Fe has ordered 75 locomotives from the Baldwin Locomotive Works. The New York, New Haven & Hartford has ordered 47 passenger and 45 mogul locomotives from the Baldwin Locomotive Works, and 40 mogul locomotives from the American Locomotive Co.

Among recent orders for cars are the following: Detroit & Mackinac, 400 freight cars from Barney & Smith; Arms Palace Horse Car Co., four coaches from Barney & Smith; Seaboard Air Line, 40 stock cars from the Western Steel Car & Foundry Co.; The Southern 2,000 gondolas, 500 box cars and two mail and express cars from the American Car & Foundry Co., 1,250 box cars from the Western Steel Car & Foundry Co. and 1,250 box cars from the Mt. Vernon Car Mfg. Co. The Delaware, Lackawanna & Western has ordered 75 standard ballast cars from the Rodger Ballast Car Co.

Trade Publications.

A description of the Gates rock and ore breakers, styles D and F, is given in a recent publication of the Allis-Chalmers Co., of Milwaukee, Wis. Smashing rock in quantities is by no means an attractively simple proposition in machine design. The rigor of the service necessitates severe strains and these must be reduced to a minimum for obvious reasons. The machines are arranged to fracture the material as the pieces are supported at their ends and in a favorable position for breaking under a light blow. Just how this is accomplished is illustrated by a number of excellent halftones.

The 1905 edition of the general catalogue from the Brown & Sharpe Mfg. Co., of Providence, R. I., has been thoroughly revised and contains 494 pages. The new matter, together with the changes in the old, make it especially desirable that the latest edition should replace all former ones. This catalogue is mailed to any address on application and without charge. The large number of tables it contains and the other general information make it very useful in shop and office as a reference work. The principal additions this year to the various lines of machines and tools are conveniently noted on a colored insert. Another insert is a reminder of the award at St. Louis for machinists' tools, measuring tools and cutters.

In connection with the discussion of the action of Secretary Morton in awarding the recent contracts for armor plate to the Bethlehem and Carnegie companies and rejecting the bid of the Midvale Steel Co., it has been stated that a part of the 6,180-ton armor plate contract which was awarded to the Midvale as lowest bidder out of the 16,629 tons for which contracts were awarded in October, 1903, was sublet to the Bethlehem Steel Co., and that this action of the Midvale Co. caused government officials to fear that it would not be able to deliver future orders as rapidly as desired by the government. Secretary Morton has stated, however, that the navy department has always appreciated the action of the Midvale Company in granting the request of the department by surrendering a part of its contract for the sole purpose of remedying an embarrassing position in which the navy department would otherwise have found itself in its relations with the shipbuilders. "The department," said the Secretary, "has nothing but pleasant words to say of the action of the Midvale Company."

At the annual stockholders' meeting of the Herring-Hall-Marvin Safe Co., held in Jersey City a few days ago, the retiring directors were re-elected. At a subsequent meeting of the board Richard T. Pullen, heretofore the vice-president, was elected president of the company, succeeding H. A. Tenney, who remains a member of the board of directors. No reason was assigned for the retirement of Mr. Tenny from the presidency. Thos. W. Styles, formerly secretary and treasurer, was succeeded by W. B. Pearson as secretary and A. Proctor, Jr., as treasurer. C. U. Carpenter, one of the directors, was elected vice-president, succeeding Mr. Pullen. S. S. Evans was elected second vice-president.

Ralph T. Prall has been appointed master mechanic of the Youngstown, O., plants of the Republic Iron & Steel Co., and Harry Z. Bixler has been appointed chief engineer.

The Charles Dreifus Co., Pittsburg, dealer in scrap iron, has been incorporated with a capital of $100,000. Charles Dreifus, H. J. Lewis and W. H. Barr are the incorporators.

PERSONAL.

A. W. Wyckoff has been appointed district manager for the National Electric Co. for Pittsburg and surrounding territory. Mr. Wyckoff was until recently the general superintendent of the plant of the Bullock Electric Mfg. Co. at Cincinnati. W. T. Spranley, formerly connected with the Bullock Electric Mfg. Co., and Lyman C. Reed, formerly with the Interstate Electric Co. and Safety Electric Co., have accepted the district managership of the National Electric Co. at New Orleans, La. and vicinity.

W. N. Stevens, for some time assistant mechanical engineer of the Rapid Transit Subway Construction Co., New York, is now connected with J. G. White & Co., New York.

W. Elwell Goldsborough, director of the School of Electrical Engineering of Purdue University and who during the past three years held the position of chief of the Department of Electricity at the Louisiana Purchase Exposition, has become associated with J. G. White & Co., of New York City.

Edward F. Neukom, mechanical engineer of the Brown-Corliss Engine Co., has been appointed chief engineer and manager of the Bates Machine Co., Joliet, Ill., and will take charge March 1.

George Downs, general night superintendent of the South Chicago works of the Illinois Steel Co., William Sutherland, night superintendent, and Jerry Sullivan, assistant superintendent of the rail mill, have resigned to accept similar positions with the Lackawanna Steel Co., Buffalo.

V. E. Edwards, of the Morgan Construction Co., Worcester, Mass., has returned from Germany, where he started a Morgan continuous hoop mill at the Dinslaken plant of the Gewerkschaft Deutscher Kaiser.

George H. Hayes, formerly with the Chicago Pneumatic Tool Co., and one of the organizers of the Chicago Tool & Supply Co., has severed his connection with the latter company. He has opened a shop at 71 W. Jackson boulevard, Chicago, for developing and making special machinery and doing experimental work.

Dr. Stutz, vice president of the Goldschmit Thermit Co., of New York, delivered a lecture on alumino-thermics at the Case School of Applied Science, Cleveland, on Feb. 14. The lecture was under the auspices of the Civil Engineers' Club of Cleveland and was well attended, most interestingly prepared and illustrated with numerous experiments.

Mr. M. Cochrane Armour, president of the Iroquois Iron Co., Chicago, sails this week for Cuba, where he will spend a vacation of several weeks.

Benner's Prophesies for 1905.

A new edition of "Benner's Prophecies of Future Ups and Downs in Prices," by Samuel Benner, has just been issued by Robert Clarke Co., Cincinnati. A year ago Mr. Benner predicted that prices for pig iron, railroad stocks and many commodities would be lower in 1904 than in 1903. He also predicted that after the year 1904 there would be a revival in trade and better times and that higher prices would prevail until the year 1911. In his forecast for 1905 he predicts that prices for pig iron will advance and be higher in 1905 than in 1904; that prices for railroad stocks and industrial securities will be higher this year than last; that there will be a revival in business, and that the volume of trade in 1905 will exceed that of 1904 many millions of dollars, and that there will be moderate good times for the next four years. He says that we are now entering an up cycle in pig iron, extending into the year 1908, indicating a prosperous period for the iron trade as well as other industries. In concluding his new edition Mr. Benner says: "The aggregate of crops for 1904 is simply enormous. Wheat, corn and oats combined amount to nearly four thousand millions of bushels, other grains and minor products fill the granaries of farmers with an abundance for every demand. The volume of money is sufficient for all legitimate requirements. We may look in any direction and find business conditions sound—East, West, North and South. The South has prospered as never before, by its enormous profits on last year's cotton crop. Who can hesitate to buy pig iron, railroad stocks and industrial securities now to make money?"

Obituary.

Charles E. Dickey, founder of the Maryland Meter & Mfg. Co., Baltimore, killed himself by firing a bullet into his head, Feb. 4. Mr. Dickey had long been an invalid and the suicidal act is attributed to mental depression. He was 72 years old and had been interested in the manufacture of gas meters since the close of the civil war. He was for a number of years senior member of the firm of Dickey, Baker & Co., which was succeeded by the Maryland Meter & Mfg. Co. Mr. Dickey retired from active business about 10 years ago.

Marvin J. Gates, treasurer of the American Wire Cloth Co., Clinton, Ill., died February 6.

Frederick William Moss died Feb. 12 at his home in Brooklyn of pneumonia after four days' illness. He had long been in the steel importing business and was a director of the E. W. Bliss Co. and of the Franklin Trust Co.

William H. Braddon, a member of the editorial staffs of the *Iron Age* and the *Metal Worker*, died suddenly at his home at Queens, Long Island, Feb. 13, aged 49 years.

Iron and Steel Institute.

The annual general meeting of the Iron and Steel Institute will be held, under the presidency of R. A. Hadfield, in the Grand Hall of the Hotel Cecil, London, on Friday, May 12. The awards of the Carnegie research scholarships will be announced at this meeting. Candidates must apply before February 25. In order to be included in the voting list at the general meeting, applications of candidates for membership of the Institute must be submitted to the Council before the end of March. As already announced in these columns, the autumn meeting will be held in Sheffield on Sept. 25 to 29, 1905. An influential committee has been formed in Sheffield for the reception of the Institute, with the Lord Mayor as chairman and the Master Cutler as vice-chairman. The chairman of the executive committee is Colonel H. Hughes, C. M. G., the vice-chairman Mr. J. Rossiter Hoyle, the Hon. treasurer Mr. Francis Huntsman, the Hon. secretaries Professor J. O. Arnold and Mr. A. McWilliam, and the Hon. assistant-secretary Mr. J. Wortley. Members are invited to participate in the International Congress of Mining, Metallurgy, Mechanics and Applied Geology, to be held at Liege on June 26 to July 1, in connection with the International Exhibition.

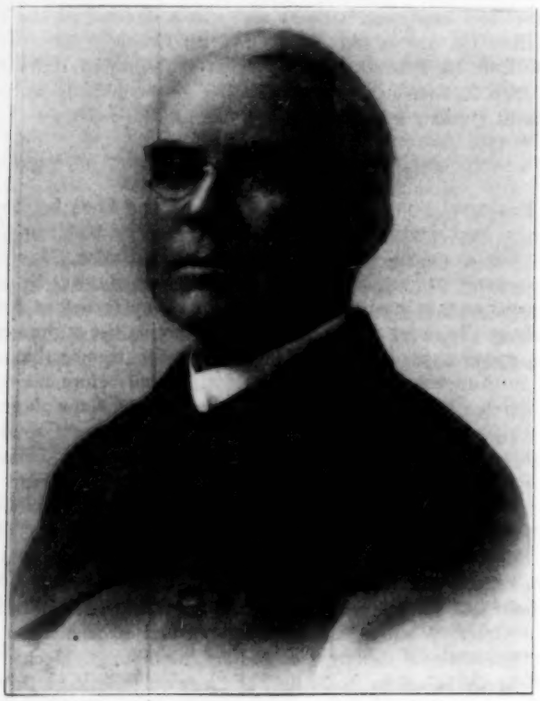
The Laclede Fire Brick Co., St. Louis, has just installed in its plant a complete laboratory, which is in charge of A. J. Aubrey, a graduate of the Ohio State University, Columbus. This company manufactures fire brick, cupola blocks, tiles, sewer and culvert pipe, etc., and analyzes all the raw materials entering into the manufacture of its products. Knowing the proportion of the different elements in the materials used the company is in position to guarantee the servicibility of its products.

No. 4 mill at the new plant of the National Tube Co. at Lorain was placed in operation February 9, when the first bloom was rolled. Skelp was rolled in the mill the following day. Work on this great plant was begun nineteen months ago, has progressed steadily, and it is expected that operations will be in progress in all the mills at an early day.

The plant of the Penn Bridge Co., Beaver Falls, Pa., was destroyed by fire last week, entailing a loss of $75,000.

THE LATE HARRISON H. TAYLOR.

Harrison H. Taylor died at his home in Detroit on Feb. 4. He was in the best sense a self-made man. He was born at Newark, N. Y., but when a mere boy went to Buffalo to learn the trade of a machinist. He became a journeyman and left for Rochester, N. Y., where he worked in several shops. Among them were the N. Y. C. R. R. Co.'s, James Graham's, William Gleason's and others. Up to that time he had neglected books, but his aptness in improving tools and machines attracted the attention of all his acquaintances. Among his shopmates was Frank M. Clarkson, a technological graduate who appreciated Mr. Taylor's inventive genius and offered to give him lessons in mechanical drawing and to aid him in arithmetic, evenings. Mr. Taylor had by that time awakened to his handicap, and he accepted the offer and made excellent progress. In 1877 Mr. Clarkson and Mr. Taylor formed a copartnership under the firm name Clarkson & Taylor, for the manufacture of set and cap screws in Detroit. That line of manufacture was then comparatively new, but competition



HARRISON H. TAYLOR.

was keen and they found a "hard row to hoe." For a considerable time the proprietors personally performed all the labor of manufacturing and Mr. Clarkson did the office work and the soliciting between times. They then laid the foundation for the Detroit Screw Works, now one of the largest manufacturers of set and cap screws. The volume of business was at first small, and the competition sharp. Mr. Taylor was alive in the fact that their strongest competitor owned superior machinery to what could be bought in the open market except (conditionally) by large users of their product, who obligated themselves not to sell any of that line of goods. With these conditions confronting him, he invented a screw machine which was in advance of anything then obtainable, but the firm had no money to build it. By this time they had bought several screw machines and had hired operatives, but found they had tied up all their money to no purpose unless the new machine "pulled them through." Outside capital was secured to build the first machine, which demonstrated its value, and in 1880 the Detroit Screw Works was incorporated and entered upon a growing career. A few years later Mr. Clarkson thought he saw better prospects in another direction and sold his interests, in part, to Mr. Taylor and Mr. George Thrall, the latter assuming the financial work and Mr. Taylor continuing in the manufacturing department. They worked harmoniously and together they made a small shop grow to an extensive factory. Mr. Thrall gives Mr. Taylor credit for producing much the larger share of their success, because of his inventive genius. Mr. Taylor not only invented screw machines, but bought screw machines of other makes and greatly improved them. His inventions on screw-machinery, tools and appliances, whether patented or kept as secret processes, were never sold to competing firms, but were kept for the sole use of his company. There were hundreds of these devices for reducing cost. Mr. Taylor did not confine his labors, however, to his company's use, but "invented to order" for others. Manufacturers came to him, gave him an idea of what they wanted to accomplish, and he would invent the machine and protect them in its use by patenting it for them. For instance, Parke, Davis & Co. of Detroit, are now using a machine for making capsules which he invented two decades ago. He was paid $5,000 for the patent. He fitted the Michigan plant of the American Radiator Co. with machinery for drilling, reaming, tapping and assembling radiator loops. He did the same for the leading radiator company of Canada and made many other improvements to the machinery of the American Radiator Co.'s Detroit plant. He invented a machine for making malleable iron bung bushings which is in use by the largest manufacturer of those goods in the United States. He also sold some of the machines to a company in Germany. He sold a screw machine of his inventon to the largest bolt works in Manchester, England, the purchasers obligating themselves not to allow its product on sale in the United States or Canada. The Taylor water tube (marine) boiler was another of his important inventions. Mr. Taylor was a great lover of the water, and in his time bought two or three steam boats and launches and built as many more. The last one built for him was the "Dream," now owned by Wm. Livingston, president of the Lake Carriers' Association. The invention of the "Taylor boiler" was due to the fact that the usual type of boiler built for the "Dream" when she was new and generally considered satisfactory, was not equal to the requirements when the big, fast liners came alongside and passed his. He concluded that the accepted plan of building marine boilers was wrong, and put his ideas into a new type and it was a success. Mr. Taylor had been in failing health for about two years and had not been active at the plant. For the past few months he seemed greatly improved and hopes were entertained of his complete recovery. He had started for a visit to Chicago the morning of the 4th instant, but was compelled to return home from the station owing to an attack of heart trouble, and died about an hour later.

Edgar Worthington, secretary of the Institution of Mechanical Engineers, writes to *Engineering* relative to the oldest locomotive engineer now living. He obtained his information from Mr. John Barr, of Kilmarnock. Mr. Barr visited Edward Entwistle at his home in Des Moines, Iowa, during the American visit of the Institution. Mr. Edwards was born near Manchester on March 24, 1815. At 14 years of age he was apprenticed in a machine shop and assigned to work on a locomotive. Locomotives had then been in use about four years hauling coal to the seaboard but had not been put to service in passenger traffic. Mr. Edwards in company with George Stephenson ran the famous "Rocket" to Liverpool and continued as locomotive engineer for 23 months when he asked to be relieved, the excessive vibration overtaxing his nerves. He came to the United States in 1837 and for many years was an engineer on locomotives, steamboats and stationary engines.

FOREIGN NOTES.

The death occurred recently of Thomas Colling Davison, of Coatham, England, who was in the iron trade of the Middlesborough district for over forty years. He was a native of the Bedale district, and came as a boy to the office of C. E. Muller. In 1892 he joined Mr. Muller as partner, and the firm, C. E. Muller and Co., have carried on an extensive business originally in pig iron, and latterly in iron ore of all kinds, especially Swedish ores.

A St. Petersburg correspondent, referring to the new Russian railway contracts, says that the representatives of British locomotive makers, including the chief Glasgow and Leeds firms, find that political antagonisms handicap them greatly in competition with German and French lines.

W. E. Storey, of the firm of Messrs. Isaac Storey & Sons, has been elected president of the Manchester Engineers' Employers' Association for the ensuing year. Mr. Storey is a prominent member of the Manchester Association of Engineers, and was the Constantine gold medalist for 1904.

The Metropolitan Railway and Carriage Company, an English corporation, is about to establish a plant at Tolosa, Argentina, for the manufacture of all kinds of rolling stock. The old workshops of the Western Railway Co. have been secured, and will be considerably enlarged and equipped with modern machinery.

It is reported that orders for 20 locomotive engines have been placed in America by the Government of New South Wales. Tenders were called for on the Continent, in England, and America, with the result that the offers received from manufacturers in the United States were found to be the most advantageous.

The over-production of trained engineers is already causing much alarm in the profession in Berlin. The competition, it is stated, has become so keen that fully-qualified engineers, equipped with the finest training the best technical universities of modern times can give them, are glad to accept appointments with a salary of £5 to £7 a month.

C. E. Muller & Co., of Middlesbrough, have just issued their annual statistics of the iron trade of the North-East Coast for 1904, which shows, among other facts, that the imports of foreign iron ores into the north-east ports of England in 1904 were 2,336,164 tons, against 2,185,997 tons in 1903, and 2,223,188 tons in 1902. This was in addition to 65,936 tons of manganese ores, and 112,109 tons of purple and burnt ores, so that the total volume of ores was 2,514,209 tons. The imports from the north of Spain have been less, while those from the south of Spain have been greater than for some years. Mr. Muller further shows that the total exports of Swedish magnetic ores from Sweden in 1904 were 3,024,017 tons, against 2,537,214 tons in 1903. The consumption of pure ores in Cleveland for hematite iron making has kept up well of late.

Some apprehension is felt among the British, French, German and Belgian steelmakers, who are the signatories of the International Steel Rail Pool, at the delay which has occurred in reference to the overtures made with American steelmakers with the view of their joining the combine. The *Iron and Steel Trades Journal* says: "The terms offered to American makers are considered very fair and reasonable, but the prospect is that with the growing facilities of output possessed by the United States they will ask for a larger percentage of the world's trade than is suggested by the British and Continental agreement. To begin with, there is not much need of fear that America will trouble the British market for orders for some time to come, as they have plenty of work in front of them from American consumers alone; but as the proposed agreement is for a period of three years, they are naturally looking well ahead before determining to sign it."

George Ainsworth, who has been general works manager of the Consett Iron Co., Limited, has been appointed general manager, and Ed. J. George, from the Wigan Coal & Iron Co., has been appointed secretary, Henry Holliday having resigned.

Sir David Dale, Bart., has been elected chairman of the Cleveland Mineowners' Association in place of the late Sir Lowthian Bell. Sir Hugh Bell, Bart., has been elected vice-chairman of the Association in place of Sir David Dale.

Though the Scottish iron trade does not control the markets as it once did, yet the issue of the returns of the ironmasters is still one of the events of the metallurgical year. For 1904 the Scottish ironmasters show that the production in that country was about 1,339,000 tons, which is one of the highest attained in the history of the trade there. It is a production that is nearly all taken up, and the stock, including that previously held, is still very small. The stock, indeed, is one of the most notable features of the return. It may be put in round numbers that about 150,000 tons of pig-iron are held by the Scottish makers and in the warrant stores north of the Tweed. When it is said that down to about the year 1896 the stocks so held exceeded half a million tons, the change in recent years will be seen to have been very great. The consumption in Scotland has increased and is increasing; and thus the larger production of the past year has been taken up, except a few thousand tons, and the very small stocks—small, that is, in comparison with those of the past—have not been added to to any material extent. It is also worth notice that the large output in Scotland has been attained, though there are fewer furnaces at work than have been in operation in some years of lesser output. It is only in recent years that there has been a production of over a million tons without a hundred or more furnaces being in operation; but in the past year the large output that has been named has been obtained with about eighty-five furnaces in blast. This points to the fact that in this comparatively ancient seat of the iron trade there has been at least some modernization of the furnaces, and that there has thus been a larger average production, so that in some degree the industry north of the Tweed has been brought more into line with modern methods, though its output is on the average much below that of the furnaces that have adopted the most modern modes.—[Iron & Steel Trades Journal.

There is but one opinion in Lancashire as to the general characteristic of the trade in iron, steel and machinery during the year which has just closed, namely: that it has been very bad for almost all concerned in it. The great difficulty of the year has been to induce consumers to take delivery of the iron which they have bought; probably no year in the history of the trade has been worse in this respect. The amount of work going forward in the big engineering shops and in the iron foundries has been small.

The annual report of the Warwick Iron & Steel Co., Pottstown, Pa., states that the company's total product of pig iron for 1904 was 125,933 gross tons. The report says that the year 1904 was far from satisfactory, as the average price of monthly shipments of iron declined month by month from January to November. "The profit, though small," says the report, "is more appreciated by those familiar with the business than by stockholders not in personal touch with the adverse conditions. The outlook for 1905 is excellent. There is danger, however, that the cost of manufacturing may be increased beyond the limit at which consumption of pig iron can be maintained at a maximum, with the same results as were experienced the summer of 1903 and month following. The balance sheet shows that the earnings for the year foot $58,853, less interest on bonds and borrowed money, $25,114, net earnings being $33,738.

A. B. Hazard Machinery Co., St. Louis, Mo., has made an assignment. Total amount of indebtedness accounted for in the deed of trust is $5,960.

THE MULLEN GAS WASHER.

A gas washer has been patented by B. J. Mullen, of Leetonia, O., and the first machine of this design was installed at the plant of the Cherry Valley Iron Co., at Leetonia. The apparatus was built by the Riter-Conley Mfg. Co., of Pittsburg, and was put in operation on Nov. 1, 1904. The cleanliness of the gas after passing through the washer is highly satisfactory and after the use of the past few months the washer is reported to be in as good condition as when it went into service.

It is not necessary to enumerate the evils that result from the dust contained in blast furnace gas. The reduced efficiency of stoves and boilers, the filling up of gas flues, the extra labor required, the reduced efficiency of gas as fuel, caused by the great quantity of dust contained in gas preventing complete combustion, are facts well known to furnacemen. The important point is to prevent gas from being carried into gas flues, boilers and stoves. Dry dust catchers depend upon the

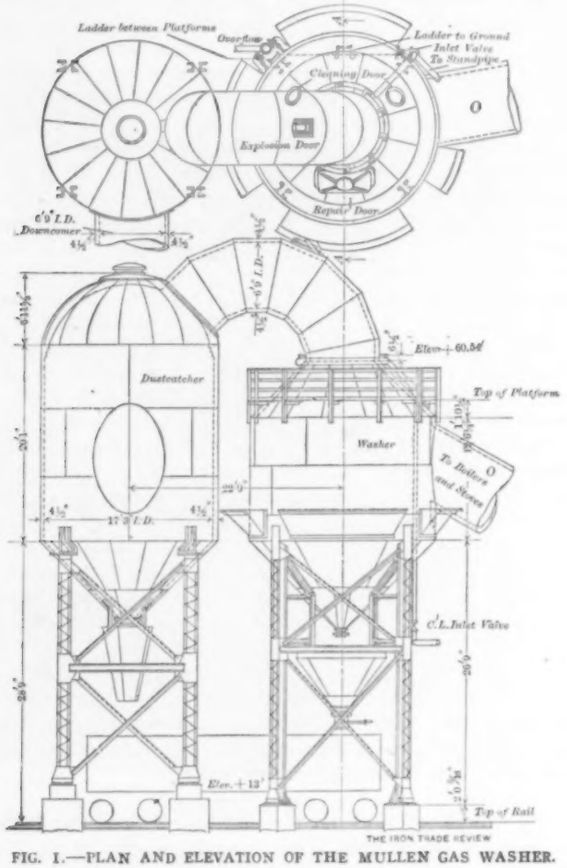


FIG. I.—PLAN AND ELEVATION OF THE MULLEN GAS WASHER.

use of baffle plates, and a capacity sufficiently large that the velocity of the gas will be reduced to a point where the particles of dust will fall to the bottom by gravity. Many furnacemen find it impracticable to build dust catchers sufficiently large to reduce the velocity of the gas to a point where any more than the heaviest particles of dust will precipitate.

Any kind of reservoir, with sufficient capacity, with bell valve on bottom for emptying, a leg from downcomer answering as well as anything, will catch the large pieces of ore, limestone, and coke thrown over in case of slips in furnace. The Mullen washer was not designed for this purpose, the sole object being to design a gas washer of the highest possible efficiency for the elimination of dust from blast furnace gas, leaving the large pieces thrown over by slips to be taken care of by the dry dust catcher where one is installed, or leg from downcomer lengthened a sufficient distance for this purpose.

No one would think of introducing all the air into a blast furnace through one large pipe, instead of twelve or sixteen tuyeres, as it would be impossible to bring the blast in contact with all parts of coke and stock. If only 25 percent of gas in gas washer, is brought in contact with water, 75 percent of gas remains unwashed, and 75 percent of dust goes over into gas flues, boilers, and stoves. The Mullen gas washer is a successful device for the purification of blast furnace gas. The volume of gas is subdivided for the purpose of washing, this division being an especial feature of the design. The large volume of gas from the furnace is divided into, from 200 to 250 parts, according to size of washer, and each chamber conducts a small portion of gas to the point where it impings on water. The water in this washer is carried from two to four inches from the end of tubes, and it is practically impossible for the gas to change its course before striking on the water.

The water supply is introduced about four inches beneath the surface and thus keeps the surface cool and lessens the evaporation. The overflow is located at the surface of the water and therefore the hottest water is continually passing off and being replaced by the cool supply. All that is necessary to carry water at the proper distance from the chambers is to turn the hand wheel higher or lower on the overflow regulating valve until water is at desired point and then it is set there permanently.

One of the difficulties met with in washing gas has been the deposit of a fine substance on top of the water, this deposit being too light to percipitate and preventing the gas from coming in contact with the water. Mr. Mullen meets this difficulty by leaving openings at intervals around the outside shell of washer. When the bell valve is opened the surface of the water is lowered to the level of these openings, and the gas on the inside of the washer immediately skims all this light substance from the surface into the outside trough, and thence to sewer. In this way the water always presents a clean surface for gas to impinge on and is so much more effective for the reception of dust.

Fig. 1 shows how the washer is connected to the dry catcher at the plant of the Cherry Valley Iron Co., at Leetonia, O. The washer and dust catcher were built sufficiently high to permit the railroad car to pass underneath and the dust from the catcher and gas washer can be emptied directly into the car and thus dispense with the labor of separately handling it. Fig. 2 is a vertical section through the washer, also a section on B B illustrating the tube plates M. Fig. 1 shows the washer attached to the dry catcher, the gas from furnace entering at Y, passing through the dust catcher and the inverted U pipe to the washer by way of A.

The washer consists of cylindrical inside and outside shells, D and K respectively. A reducing cone is at the top to receive the inlet pipe and there is a reducing cone on the bottom for the bell valve, for emptying. The inside shell D has an angle iron on the bottom for supporting one end of the tube plates M. The other end of the tube plates are supported by extra heavy pipe hangers L, through which the supply water is introduced and in this manner they are kept at a uniform temperature. The tube plates M are cored out to receive the tubes C. These have an inside diameter of 6 in. The tubes are cast with a small collar on the top end and are slipped through the holes in the plates and held by the collars. In removing dust from the washer, the bell valve G is opened and the dust emptied into the hopper H. This is continued at intervals of one and a half or two hours according to general conditions, until the hopper H is full of dust, the water passing from H through the overflow I. The valve J is then opened and the dust emptied into the car. Where a cinder pit is used the dust can be flushed directly from the washer to the pit. In order to have a free outlet to a pipe conveying gas to water it is advisable that the pipe shall terminate at a distance from the water of at least one-fourth of the diameter

of the pipe. With a pipe 84 in. diameter this would equal a 21 in. space. As in the present type of washer the gas is conveyed through tubes only six inches in diameter and that ample provision is made for the ascending gas between the tubes, it is possible to carry the water level within two inches of the ends of the tubes and it is therefore practically impossible for the gas to escape contact with the water.

The action of the gas in the water is as follows: The gas enters through the pipe A into the body of the gas washer B and here the large volume of gas is subdivided for washing purposes. The gas passes through the chambers C, each conducting a small portion of gas to the point where it impings on the water at X. The gas then ascends and passes between the chambers C, the area between the chambers C being left 20 percent greater than the area of the inlet pipe A

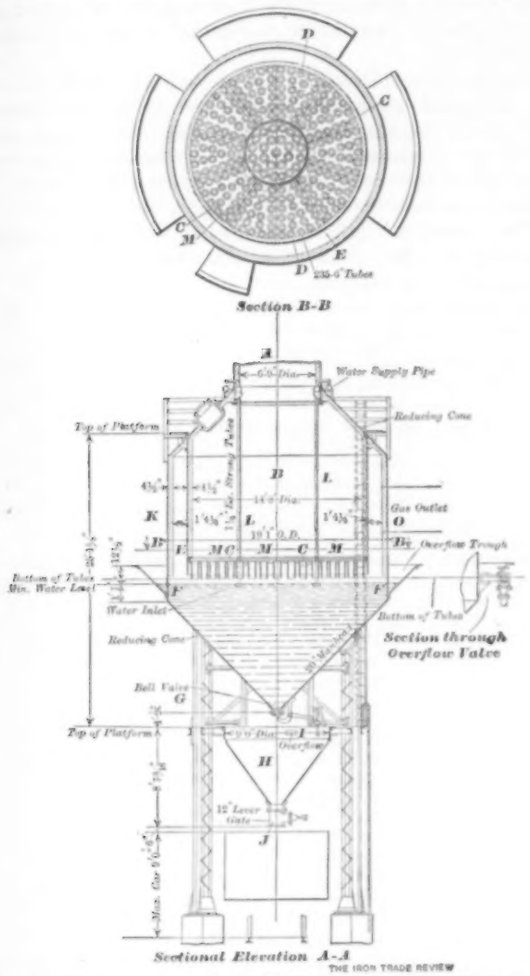


FIG. 2.—VERTICAL AND HORIZONTAL SECTIONS OF THE MULLEN GAS WASHER.

for this purpose, and thence to the circular plate D where the gas again descends and meets the water, passes through the annular space E and then through the pipe O, in Fig. 1 to the boilers and stoves. The opening in the shell at F is where the light substances collecting on the surface of the water are skimmed into the trough.

The inventor calls attention to the following features of the apparatus: The subdivision of the gas for thorough cleansing. The impossibility of the gas changing its course before contact with the water. The area between the tubes is greater than the area of the inlet pipe and hence there is no back pressure. The gas is rewashed after passing to the circular plate and on the way to the annular space E. Moisture could only be carried over from the washer by the gases, usually at temperatures of 400 to 500 degrees, impinging on the surface of the water and raising the temperature to a point where excessive evaporation would occur. This is prevented by the introduction of the water supply below the surface and also by the fact that the overflow is at the surface and the heated water is removed continuously and replaced by the cool supply. The temperature of the overflow from the washer now in use is found to be about 100 degrees and there is of course very little evaporation at this low temperature. The difference in temperature of the gas before and after passing through the washer is barely perceptible with the ordinary blast furnace pyrometer.

Canadian Industrial News.

Toronto, Canada, Feb. 14.—According to the report of the Department of Trade and Commerce of Canada for the month of October last, which has just been issued, the exports of iron and steel and manufactures thereof during that month were as follows: Agricultural implements $189,075, as against $179,140 in October, 1903; machines and machinery $27,413, as against $43,238 in October, 1903; and other iron and steel $101,237, as compared with $208,752, for the same month of the previous year. The decline under the last two headings is a measure accounted for by the increased home demand for iron and steel products. The most noteworthy increase is in the export of agricultural implements to Australasia (including New Zealand) which has risen from $145,095 to $164,589.

The management of the Sault Ste. Marie Steel Rail Works have forwarded a claim for $3 per ton bounty on steel rails, amounting in all to about $60,000 to the Canadian government. It appears that such a bounty was voted by Parliament for the manufacture of certain classes of steel used in structural work. This was not supposed to apply to steel rails as these are protected by a duty of $7 per ton. Owing to the uncertain wording of the act it is contended by the company that steel rails are included. The question was submitted to A. B. Aylesworth, K. C., for a legal opinion, which has been given in favor of the validity of the claim. Should this view be sustained an additional stimulus will be given to the manufacture of steel rails in Canada.

The Shipbuilding and Investment Co. has been organized in Halifax, N. S., for the establishment of a steel shipbuilding industry with George S. Campbell as president, J. A. Johnson, vice-president and G. F. Pearson secretary-treasurer. A site on the eastern side of Halifax harbor with a good water frontage has been secured.

As a result of the crushing defeat of the Ross government of Ontario, at the recent provincial election, a new administration has been formed with Hon. J. P. Whitney as Premier. Major John S. Hendric, vice-president and manager of the Hamilton Bridge Works, and largely interested in other industrial concerns, has been taken into the administration as minister without portfolio.

The Canadian Pacific Railway is making additions to its rolling stock, having placed extensive orders for combined passenger and freight engines of which 10 will be built by the Kingston Locomotive Works, 30 by the Montreal Locomotive & Machine Co., and 10 at the C. P. R. Angus shops. Sixteen snow ploughs have been completed for the west.

The Pennsylvania Steel Co. has increased its holdings of Cornwall Ore bank shares to twenty-five ninety-sixth parts, by the purchase of two ninety-sixth shares for $200,000. The company several years ago paid $2,025,000 for fifteen shares and $1,200,000 for eight shares.

The plant and real estate of the Georgia Car & Mfg. Co., Savannah, Ga., will be sold at public auction on March 7, at the court house door, Savannah.

PRODUCTION OF STEEL INGOTS AND RAILS IN 1904.

The American Iron and Steel Association publishes the following virtually complete statistics of the production of Bessemer steel ingots and castings in the United States in 1904; also of Bessemer steel rails rolled by the producers of Bessemer steel ingots:

Ingots and Castings.—The total production of Bessemer steel ingots and castings in 1904 was 7,859,140 gross tons, against 8,592,829 tons in 1903, a decrease of 733,689 tons, or over 8.5 percent. The production in 1902 was the largest in our history—9,138,363 tons.

The following table gives the production of Bessemer steel ingots and castings in the last six years. Of the production last year 16,051 tons were steel castings, against 18,099 tons in 1903.

Years. Gross Tons	Ingots and Castings	Years. Gross Tons	Ingots and Castings
1899.....	7,586,354	1902.....	9,138,363
1900.....	6,684,770	1903.....	8,592,829
1901.....	8,713,302	1904.....	7,859,140

Below we give by States the production of Bessemer ingots and castings in the last four years.

States—Ingots and Castings	1901 Gross Tons	1902 Gross Tons	1903 Gross Tons	1904 Gross Tons
Pennsylvania	4,293,439	4,209,326	3,909,436	3,464,650
Ohio	2,154,846	2,528,802	2,330,134	2,050,115
Illinois	1,324,217	1,443,614	1,366,569	1,257,190
Other States	940,800	956,621	986,690	1,087,185
Total	8,713,302	9,138,363	8,592,829	7,859,140

There were no Clapp-Griffiths works in operation in 1904 and only 2 Robert-Bessemer plants were active. Eleven Tropenas plants were at work, as compared with 8 in 1903. In addition 2 plants made steel by the Bookwalter process and 5 plants made steel in special Bessemer converters. All these active works make a specialty of steel castings.

Rails.—The production of all kinds of Bessemer steel rails by the makers of Bessemer steel ingots in 1904 was 2,084,438 gross tons, against a similar production in 1903 of 2,873,228 tons. The production in 1904 was 788,790 ton less than in 1903. The maximum production of Bessemer steel rails by makers of Bessemer ingots was reached in 1902, when 2,876,293 tons were made.

The following table gives the production by States of Bessemer steel rails by the producers of Bessemer steel ingots in the last four years. Included in the figures for 1904 are 11,901 tons of renewed rails rolled by mills operated by companies which manufacture Bessemer ingots.

States—Rails	1901 Gross Tons	1902 Gross Tons	1903 Gross Tons	1904 Gross Tons
Pennsylvania	1,406,008	1,148,425	1,185,191	801,657
Other States	1,430,265	1,727,868	1,688,037	1,282,781
Total	2,836,273	2,876,293	2,873,228	2,084,438

In the following table we separate the production of rails weighing 45 pounds and less than 85 pounds to the yard from those weighing less than 45 pounds and over 85 pounds to the yard. Bessemer rails made from purchased ingots or from rerolled rails by companies which do not manufacture Bessemer ingots are *not included.*

States—Rails. Gross Tons	Under 45 Pounds	45 Pounds and less than 85	85 Pounds and over	Total Gross Tons
Pennsylvania	127,136	438,669	235,852	801,657
Other States	103,630	751,962	427,189	1,282,781
Total for 1904..	230,766	1,190,631	663,041	2,084,438
Total for 1903..	178,146	1,529,580	1,165,502	2,873,228

The total production of rails in 1904 will include rails made from open-hearth steel, rails rolled from purchased Bessemer blooms, crop ends, and "seconds," and rails rerolled or renewed by non-producers of Bessemer steel ingots, and iron rails. The total from all these sources in 1903 amounted to 119,249 tons, of which quantity 45,054 tons were open-hearth steel rails and only 667 tons were iron rails. In 1904 the total from these sources will amount to about 200,000 tons, making the total rail production for that year about 2,300,000 tons.

In 1904 this country exported 414,845 tons of steel rails and 1,405 tons of iron rails, and imported 37,776 tons of iron and steel rails.

NEW ENGLAND FOUNDRYMEN'S ASSOCIATION.

The regular monthly meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, on Wednesday, Feb. 8. Report of progress was received from the committee on pig iron storage warrant system, and it was announced that the committee expected to have Geo. H. Hull, President American Pig Iron Storage Warrant Co., present at the next meeting to give further information relative to this subject.

After a short intermission the meeting adjourned to dinner, after which the president introduced Mr. Henry Souther, of the Henry Souther Engineering Co., Hartford, Conn., who gave a very interesting address on the "Physics of Cast Iron Practically Considered." At the conclusion of the address a unanimous vote of thanks was extended to Mr. Souther.

There being no further business, the meeting adjourned at 9:00 P. M. The following were in attendance:

Henry Souther, Hartford, Conn.
John Magee, Magee Furnace Co.
Walter B. Snow, B. F. Sturtevant Co.
Harry Gibby, Mechanics Foundry Co.
B. M. Shaw, Walker-Pratt Mfg. Co.
Geo. H. Lincoln, G. H. Lincoln & Co.
Fred F. Stockwell, Barbour-Stockwell Co.
W. C. Skulley and W. F. Savage, Smith & Anthony Co.
F. J. Stewart, Jas. Stewart & Co.
Chas. J. Caley, Russell & Erwin Mfg. Co.
A. L. Lovejoy, Becker-Brainard Milling Mach. Co.
Geo. O. Sawyer, Hartford Laboratory Co.
Geo. B. Buckingham, Arcade Malleable Iron Co.
T. R. Scott, Brown & Sharpe Mfg. Co.
W. A. Garratt, Whiting Foundry Equipment Co.
Wm. H. Stafford, Geo. H. Gibby and E. S. Decker, Gibby Foundry Co.
W. M. Saunders, Saunders & Franklin, Chemists.
Wm. J. Breen, Hugh W. Adams, Agt.
E. J. Lyon, Brown & Sharpe Mfg. Co.
E. V. Hazard, Old Colony Foundry Co.
J. W. Busch, Pratt & Cady Co.
G. S. Bullock and A. J. Miller, Whitehead Bros. Co.
Wm. C. Doherty, Doherty Bros.
L. N. Perrault, B. F. Sturtevant Co.
D. L. Moody, Rogers, Brown & Co.
O. E. Nutter, Saco & Pettee Machine Shops.
T. C. Wilson, Barbour-Stockwell Co.
G. A. Locke and A. B. Herrick, Smith & Wallace Co.
C. C. Boyden, Matthew Addy & Co.
S. G. H. Fitch, Vaughn Machine Co.
Jas. B. Jordan and David Baker, Massachusetts Steel Casting Co.
Henry A. Carpenter, A. Carpenter & Sons Fdy. Co.
J. O. Henshaw, N. S. Bartlett & Co.

The will of the late William Sellers, of Philadelphia, appoints as trustees William F. Sellers, Alexander Sellers, Charles Carson Fediger, Charles Bullen Dunn and John G. Johnson, to whom are entrusted important duties. The trustees are directed to appropriate the entire income in excess of $20,000 per annum, which is to be paid to members of the family, to the liquidation of debts growing out of Mr. Sellers' connection with the Midvale Steel Co. and the Edgemoor Iron Co. After explaining how he came to assume the debts in connection with the two companies, the testator says: "I have been pursuing a system of economy in reducing this, devoting all my earnings, beyond unavoidable outlays thereto. It is my desire that the same system shall be pursued after my death, until the end has been accomplished. Any other course would be foolish and hazardous."

The Pratt & Whitney Co. has declared the regular quarterly dividend of one and a half percent on preferred stock.

BLAST FURNACES BUILDING OR REBUILDING.

The *Bulletin* of the American Iron and Steel Association for Feb. 15 gives the following summary of blast furnaces building or rebuilding:

At the close of 1904 there were 10 building blast furnaces in the United States, as compared with 23 at the close of 1903. In addition 5 furnaces were being rebuilt or reconstructed at the close of 1904. Below we give a list of the building and rebuilding furnaces on December 31, 1904, all of which when completed will use coke alone or bituminous coal and coke mixed for fuel. The new furnaces are as follows:

Lackawanna Furnaces, Lackawanna Steel Company, Buffalo. Three coke stacks at Lackawanna, Nos. 4, 5, and 6, each to be 94 by 24 feet; product Bessemer pig iron; total annual capacity, 240,000 gross tons. No. 4 was blown in on January 21, 1905; No. 5 will be completed in May and No. 6 in September, 1905.

Monongahela Furnace, (C,) National Tube Company, Pittsburg. Furnace at McKeesport. One coke stack, to be 90 by 22 feet; product, Bessemer pig iron; annual capacity, 150,000 tons. Construction temporarily suspended.

Cambria Furnace No. 7, Cambria Steel Company, Arcade Building, Philadelphia. Furnace at Johnstown. One coke stack, 85 by 22 feet; product, Bessemer and basic pig iron; annual capacity, 150,000 tons. Date of completion uncertain.

Union Furnace No. 2, Union Iron and Steel Company, 71 Broadway, New York. Furnace at Big Stone Gap, Virginia. One coke stack, 75 by 18 feet; partly built in 1892 and work suspended; construction resumed in 1903; product, Bessemer, forge, and the foundry pig iron; annual capacity, 50,000 tons. May be completed in 1906.

Ensley Furnace No. 6, Tennessee Coal, Iron, and Railroad Company, Birmingham. Furnace at Ensley. One coke stack, 85 by 20 feet; product, basic pig iron; annual capacity, 100,000 tons. Will be ready for blast in April, 1905.

Woodward Iron Company, Woodward, Alabama. One coke stack, to be known as No. 3, 85 by 20 feet; product, foundry and forge pig iron; estimated annual capacity, 90,000 tons. The time for completion is indefinite.

Lorain Furnace No. 4, The National Tube Company (of Ohio), Lorain. One coke stack, 85 by 22 feet; product, Bessemer pig iron; annual capacity, 150,000 tons. Virtually completed in January, 1905; time for blowing in indefinite.

Minnequa Furnace, (F,) Colorado Fuel and Iron Company, Denver. Furnace at Pueblo. Commenced building one coke stack in 1902, to be 85 by 20 feet; product, Bessemer pig iron; annual capacity 125,000 tons. Will probably be ready for blast some time in 1905.

The total estimated annual capacity of the 10 new furnaces in course of erection on December 31, 1904, was 1,055,000 gross tons.

On December 31, 1904, the 5 furnaces being rebuilt or reconstructed were as follows, their estimated annual capacity being 559,000 tons.

Ashland Furnace No. 1, Ashland Iron and Mining Company, Ashland. Rebuilding one raw coal and coke stack; size increased from 62 by 16 feet to 75 by 17 feet; estimated annual capacity, from 25,000 to 30,000 tons of ferro-silicon or about 75,000 tons of Bessemer or foundry pig iron. Will probably blow in on March 1.

Belfont Furnace, Belfont Iron Works Company, Belfont, Ohio. Rebuilding one coke stack, 66 by 16 feet; annual capacity, 60,000 tons. Will probably be ready for blast by March 1, 1905.

Central Furnaces, American Steel and Wire Company, Chicago. Furnaces at Cleveland. Two rebuilding coke stacks; Nos. 1 and 2, each to be 90 by 22 feet; total annual capacity of the two furnaces, 324,000 gross tons. No. 1 was blown in on January 10, 1905, and No. 2 will probably be ready for blast on March 1, 1905. No. 5 was built in 1900-1 and is 100 by 22 feet. When Nos. 1 and 2 are rebuilt the three furnaces will have a total annual capacity of 504,000 gross tons.

Martins Ferry Furnace, Wheeling Steel and Iron Company, Wheeling. Furnace at Martins Ferry, Ohio. Rebuilding one coke stack, to be 80 by 18 feet; annual capacity, 100,000 tons. Will probably be ready for blast by April 1, 1905.

LAKE SUPERIOR IRON MINES.

The deal for opening the Atikokan mines and the erection of a furnace and other works on the Canadian end of Lake Superior is practically closed, and that the town of Fort William has secured the location by the passage of a by-law providing for the gift of 20 acres for a site, for exemption from taxes for 20 years and by the agreement of the people to underwrite $200,000 of a $1,000,000 bond issue. The deal includes the opening of the mines of the Hunter-McKellar location on Atikokan river, where explorations made by the American Steel & Wire Co. showed about 5,000,000 tons in sight, with great possibilities of increase, the construction of a short branch line of the Canadian Northern to the location, the erection of a furnace, coke ovens, coal docks and ore piers at Fort William. The hope is that these works may be extended to steel later. The ore may have to be crushed and roasted, to eliminate sulphur, and if this proves necessary, it can be done by the waste gases, but many furnacemen deny the necessity of any roasting for the sulphur in these ores—there is not much and what there is seems to be near the walls of the veins.

Some buildings are under way at Moore mine, of the Oliver Iron Mining Co., on the Cascade range. After the close of navigation this mine was maintained actively stripping by hand crews, and it will be ready for a large output this year. Its ore is hard and goes to Escanaba, where it is passed through the new crushers. Mining can be cheaply done and the ore is a silicious character that is desirable as a mixture for Mesabis. The mine used to be called the "Mesabi Friend" on this account.

There seems to be a great rush of speculators to Brainerd and Deerwood, Crow Wing county, Minn., on account of statements that have been made as to work in the so-called Cuygona range, which is under exploration. Another six months will determine a good deal as to the value of this district. Two outside interests are working there now—Pickands, Mather & Co. and a group of Duluth men who have been successful in finding ore on lands belonging to one of their number near Hibbing. They are putting down several holes, but with no great success, as yet, it is understood. They did get one hole into some 50 percent ore, however. Most of the work is by the original discoverer of the district, Mr. Cuyler Adams, of Duluth, and his associates. If the region proves a good one, he and they are to be congratulated, as their holdings in that vicinity are naturally very large.

There seems to be some talk of a possible consolidation of the Lake Superior iron interests in copper mines near Bisbee, Arizona, and it is quite likely that such a deal will be put through soon. If it is, it will make one of the very important copper mines of the world, with a possibility of vast production in a few years time. The district is very rich, according to all accounts, and the Lake Superior crowd seems to have a large share of it. Indeed, the Phelps, Dodge & Co. holdings and those of the Lake crowd headed by Messrs. Brigs and Hoatson, of Calumet, Cole, Congdon and d'Autrement, of Duluth; Tener, of Pittsburg, and Gayley and associates of New York, are said to almost cover Bisbee's productive area.

Explorations at the old Pike mine, eastern Gogebic range, are claimed to have found good ore in what seems considerable quantity. The Gogebic is quite active now, in both mine operations, explorations and new development by deep, large shafts. Several steel shafthouses are under construction and more are planned for the immediate future.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Vulcan Machine & Foundry Co., Birmingham, Ala., has been incorporated with a capital of $10,000 and has purchased the plant of the Wulburn Machine & Foundry Co., consisting of foundry, machine shop, blacksmith and pattern shops. The new company will manufacture saw mills, edgers, trimmers, cut-off saws, lumber trucks, mine specialties, hoist drums, tipplers, shearers, screen bars and do general repairing work.

The Alliance Mine Equipment Co., Alliance, O., incorporated with a capital of $40,000, has leased a plant and will soon begin the manufacture of mine gates.

W. M. Holmes, Canton-Hankow railroad, Canton, China, wishes catalogues from firms manufacturing railway supplies, machinery, cables, hoists, etc.

The Pennsylvania railroad has issued a list of machine tools required for its new shops at Renova and Olean, N. Y., the estimated cost of which is $600,000. The Otto Gas Engine Co., Philadelphia, is preparing a list to be placed in its new shops at Wilmington. The Bethlehem Steel Corporation is having a list prepared for its enlarged shops in South Bethlehem, Pa.

The Ward Iron Co., Bristol, Tenn., has been organized to develop valuable iron properties in Johnson county, near the Virginia line. The officers of the company are: President, A. McBradley; secretary and treasurer, Bradley Kreger. The company will build a few miles of railway to connect the mines with the Virginia & Carolina railway near Damascus, Va.

The Kingsland-Kay-Cook Mfg. Co., St. Louis, Mo., will soon be in the market for a complete line of sheet-metal working machinery.

The Iowa Building Block Machine Co., Waterloo, Ia., has been incorporated with a capital of $60,000. The incorporators are: George L. Dixon and others.

The A. B. Robbins Iron Co., Boston, has been incorporated with a capital of $350,000. The officers are: President, Charles L. Gilliatt; treasurer, Alpheus B. Robbins; clerk, Allison K. Warren.

The Niagara Tachometer & Instrument Co., Niagara Falls, has been incorporated with a capital of $200,000 to manufacture tachometers, gyrometers and other rotary speed indicators. The directors are: C. R. Huntley, Addison H. Hinman, George J. Howard, Buffalo; W. A. Breckenridge, Delancy Rankin, Henry C. Francis, B. V. Norton, Niagara Falls.

The Twin Brace Fence Co., Peoria, Ill., capitalized at $12,500, has been incorporated to manufacture tools, implements and machinery. The incorporators are: Frank J. Collier, W. F. Barton and J. R. Barton.

A certificate of incorporation of the Elevator Air Brake Co., of Chatham, Columbia county, N. Y., was filed last month with the Secretary of State. The capital is $250,000. The directors are: Le Roy Clark, Alfred H. Meech and I. H. Lehman, of New York City.

The John J. Cody Co., Brooklyn, N. Y., has been incorporated with a capital of $1,000. The incorporators are: John J. Cody, James F. Cody and John J. Cody Jr.

J. G. Gardner, Jacksonville, Fla., is in the market for punching machine, radial drill, shears and forge.

William and Otto Schwender, Mankato, Minn., having formed a partnership to be known as Schwender Brothers, have established The Novelty Works, a machine manufacturing and repairing establishment. They will make a specialty of gasoline engines.

Articles of incorporation were filed February 2 by the Stevenson & Leonard Machine Co., Albany, N. Y. The capital stock is $10,000. The directors are: George H. Stevenson, P. A. Leonard, C. H. Hoy and W. J. Lane.

The Peninsular Machine Co., Detroit, Mich., has filed articles of incorporation. The capital is $5,000, of which $1,200 has been paid in machinery, materials and patterns. The incorporators are: John A. Erzold, John E. White and Otto F. Barthel.

The Dillon Iron Works, Dillon, S. C., have been incorporated with a capital of $10,000. The incorporators are: P. G. Haselden, George Benedict, William M. Hamer and A. B. Jordan.

The Stevenson & Leonard Machine Co., Albany, N. Y., has been incorporated with a capital of $10,000 to manufacture machinery. The incorporators are: Geo. H. Stevenson, Peter A. Leonard, Chas. H. Hay, of Albany.

Adam's Steel & Wire Works, Joliet, Ill., will soon be in the market for machinery for the welding of large size wrought iron pipe.

The Isthmian Canal Commission will receive proposals up to Feb. 28 for 25 pneumatic rock drills, three complete sets of blacksmith tools, for making bits and three for making shanks, and 25 extra steam heads for drills.

The Reedy Foundry Co., Chicago, has been incorporated with a capital of $50,000 to do a foundry and machine shop business. The incorporators are: W. H. Reedy, W. E. Wakefield and Joseph Price.

The Edward C. Griffith Co., New York, has been incorporated with a capital of $10,000 to manufacture motors, engines and machinery. The directors are: Edward C. Griffith, M. P. Griffith and Fred J. Titus, New York.

Articles of incorporation of the Iowa Building Block Machine Co., Waterloo, Ia., with a capital of $60,000, have been filed with the Secretary of State. George L. Dixon and others are incorporators.

The Frank C. McLain Co., New York, has been incorporated with a capital of $300,000 to manufacture machinery. The incorporators are: Frank C. McLain, James K. Peacock, C. E. Mead, all of New York.

Harris-Edelston Conveyor Co., New Orleans, has been incorporated, with $50,000 capital, to construct and operate conveying machines or other devices for loading and unloading cargoes. Beverly J. Harris is president; George J. Edelston, vice-president, and Henry S. Renshaw, secretary-treasurer.

Frank Wright, Cave Springs, Ga., wants to correspond with manufacturers of punching dies for galvanized sheet iron.

The Bessemer Iron Mines of Sault Ste Marie, Ont., have been incorporated. The capital is $200,000. The incorporators are: Robert Henry, of the Canadian Soo, and E. S. B. Sutton, C. W. Baldwin, A. B. Standish, and T. Bailey, of the Michigan Soo.

The Duluth Mesabi Iron Co., Duluth, Minn., has been incorporated with a capital of $500,000. The incorporators are: Marcus F. Fay, Franklin W. Merritt, Cyrus T. Crandall, Lucian R. Barnes and Simond Clarke.

Fires and Accidents:—

The Baltimore & Ohio railroad shops at Lorain, O., were visited by a destructive fire on the night of Feb. 10, causing a loss of about $50,000. The entire locomotive department, including machine shop, erecting plant, tank house and tool shop, was totally destroyed, with contents. Six locomotives in the erecting shop will be almost complete wrecks. Three hundred men are thrown out of employment, many of them losing valuable tools.

Fire in the iron foundry and machine works of Stewart & Bruckner, Chattanooga, Tenn., Feb. 6, caused a loss of about $25,000; insurance $7,000.

The Watkins Machine & Foundry Co., Hattiesburg, Mass., sustained a loss of $9,000 from fire February 1. Only the

foundry was burned, the machine and wood working establishments escaping unscathed. The plant will be rebuilt.

The foundry of J. S. Gardner, New Albany, Ind., was recently damaged by fire to the extent of $1,000, covered by insurance.

G. Frankie's machine shop, Traverse City, Mich., was damaged by fire recently to the extent of $1,200. He will immediately rebuild.

Fire in the plant of the Victor Talking Machine Co., Camden, N. J., caused a loss of $60,000.

Driscoll's Machine Shop, Bound Brook, N. J., was destroyed by fire Feb. 7. Loss $15,000.

Fire broke out in the blacksmith shop connected with the Grand Trunk shops at Point St. Charles, Quebec, Feb. 4, causing damage amounting to $10,000.

One of the foundries of the plant of the Canton Malleable Iron Co., Canton, O., was destroyed by fire February 7. Loss $25,000.

New Construction:—

The recent fire at the plant of the J. L. Mott Iron Works, New York City, did not do a large amount of damage and manufacturing has not been interfered with. The company is equipping its new plant and expects to commence operations there in about a month.

The Kinnear Mfg. Co., Columbus, O., has completed plans for the construction of a new plant, 200 x 400 ft., which will be fireproof. The old plant at Fourth and Lincoln streets, and the foundry at Scioto and Water streets, will be sold with the land on which they are located.

The Bryant Steel Wheel & Rim Co., Columbus, O., recently incorporated with a capital of $100,000, expects to erect a new plant. The organization of the company has been completed with the election of R. S. Bryant, W. A. Marsh, Lincoln Kilbourne, Campbell Chittenden, H. L. Thomas, Leander M. Ferguson and Ernest A. Smith as directors. The officers of the company are: President, W. A. Marsh; vice president, Lincoln Kilbourne; secretary and treasurer, H. L. Thomas.

The Economic Stove Co., Jacksonville, Ill., has purchased a site and will erect a foundry as soon as the weather will permit. It is now having its castings made in Quincy, Ill. The company may also equip its foundry to do a jobbing trade in addition to its own work. The following officers have just been elected for the ensuing year: President, C. F. Tonn; vice president, James O. Priest; secretary, John A. Unglaub. The capital stock has been increased to $25,000.

The Duff-Trowbridge Stove Co., Hannibal, Mo., will erect a new building, four stories and covering an area 65 x 150 ft. The first floor will be used as a mounting room and the upper stories for storage purposes.

The Favorite Stove & Range Co., Piqua, O., will erect an addition, 55 x 125 ft., to be used for polishing and japanning departments. Work on another large addition is now making rapid progress.

With improvements contemplated by the Norfolk & Western railroad, the capacity of the shops at Portsmouth, O., will be practically doubled this year. A new tank shop 150 x 175 ft. will be erected this spring. A foundry may also be added to the shops.

The Minneapolis & St. Louis railroad will build division shops at Fort Dodge, Ia. The present shops are equipped for light work only.

The city of Muncie, Ind., through the efforts of its Commercial Club, has raised the $10,000 bonus necessary to secure the removal to Muncie from Montpelier, Ind., of the boiler manufacturing plant of the Broderick-Quinlan Co. Work on the new plant will be started as soon as the weather will permit, and employment will be given to 125 men as soon as it is completed.

The Metropolitan Railway & Carriage Co., an English corporation, is about to establish a plant at Tolosa, Argentina, for the manufacture of all kinds of rolling stock. The old workshops of the Western Railway Co. have been secured and will be enlarged and equipped with modern machinery.

The warehouse of the Crane Co., of Chicago, Birmingham, Ala., which was destroyed by fire Jan. 26, will be rebuilt.

Plans have been completed for the new plant of the Leader Iron Works, Decatur, Ill. The building will be 176 x 52 ft.

Herzler & Henninger, manufacturers of mining drills and other machinery at Belleville, Ill., will add a foundry to their plant for the manufacture of their own castings.

An additional annealing oven is now in course of construction at the plant of the Iowa Malleable Iron Co., Fairfield, Ia. An additional room for shipping purposes will also be erected

William W. Mitchell, a wealthy lumberman of Cadillac, Mich., has announced that a charcoal iron blast furnace will be built in that city. The other stockholders are: D. F. Diggins, F. J. Cobbs, Edward Fitzgerald, all of Cadillac; W. L. Loutit, of Spring Lake; William Ford, of Fruitport; and I. C. Bean, of Milwaukee. The work of building the plant will be begun as soon as the frost is out of the ground. The capacity of the stack will be 100 tons per day.

The High Duty Saw & Tool Co., recently incorporated by capitalists interested in the Frankford Forge Works, of Eddystone, Pa., will build a plant for the manufacture of saws, metal cutting tools and other machinery. The plant will be 100 x 40 ft.

The directors of the Carlisle Body & Gear Works, Carlisle, Pa., whose plant was totally destroyed by fire last month, have decided to reorganize and increase their capital to $30,000. A new plant will be erected.

The Jackson Engine & Motor Co., Jackson, Mich., is about to let a contract for erecting a fireproof plant on a site 700 x 200 ft. adjoining the Lake Shore railroad.

The Armstrong Bros. Tool Co., Chicago, is erecting a new plant of which the main building will be 60 x 175 ft., three stories and basement, with an extension to the first floor of 30 ft.

The Indianapolis Drop Forge Co., Indianapolis, whose plant was destroyed by fire last July, has completed its new works, consisting of a main building 50 x 250 ft. and an addition 55 x 150 ft., of brick and stone. The buildings have been equipped.

The Meyersdale Sheet Steel Co., Meyersdale, Pa., will have its plant in that city in operation within 30 days. The plant contains two 24-in. hot mills and one 20-in. cold mill. The product will be black plate and planished steel sheets, gauges 18 to 30.

The General Engine Co., Buffalo, N. Y., organized to manufacture the Hoffman rotary engine, has increased its capital to $2,000,000, of which a sufficient amount has been paid in for the construction of a plant in Buffalo.

The Blanchard Machine Co., Cambridge, Mass., will build a new machine shop of concrete and brick, two stories, 60 ft. square.

The Frost Mfg. Co., Galesburg, Ill., has begun excavation for the erection of additions to its plant, which will consist of an expansion to its boiler shops and a shop for the manufacture of flanging machinery.

The Central Iron Works, Syracuse, N. Y., have let contracts for parts of their new plant. The main building will be 135 x 235 ft., and there will be several smaller buildings.

Cambria Steel Co., Johnstown, Pa., will build large additions to its Franklin plant, doubling the present capacity of the car shops.

The Charles E. Sutton Co., Toledo, will soon begin the manufacture of steel castings. A plant for that purpose is now being erected. Machinery will soon be installed.

The Fanner Mfg. Co., Cleveland, has increased its capital stock from $100,000 to $400,000. Plans have not yet been perfected for erecting new buildings this summer. There will be two or three large structures, which will double the capac-

ity of the plant which was destroyed by fire some months ago.

The Deved Sash Weight Works, Baltimore, will build an addition 16 ft. x 33 ft., one story and basement.

Aurora Foundry Co., Aurora, Ill., will erect an addition so that the foundry will be 200 ft. long by 70 ft. wide. A new building will be constructed for the pattern department, which will be 30 ft. x 60 ft. A new office building is also included in the improvements.

Daniel O'Connell, White Sulphur Springs, W. Va., treasurer of the Southern Development & Construction Co., recently organized with a capital of $250,000, states that his company will build a 200-ton furnace on Anthony's Creek, Greenbrier county, on the line of the Iron Mountain & Greenbrier Railroad, and will develop what is claimed to be very promising iron ore fields. The company also has in view the further extension of the railroad and the building, probably at Lynchburg, of a 100-ton furnace for using iron ore from Pittsville, Va. The officers of the company are: President, J. H. C. Barr, Philadelphia; vice president, E. Cooper Shapley, also of Philadelphia; assistant to the president, J. T. Lightner, of Danville, Va. The company has taken offices in the Stephen Girard building, Philadelphia, and it is expected that the capital stock will be increased sufficiently to meet the improvements contemplated.

Reports current recently to the effect that the Chesapeake & Ohio Railroad Co. intends to build locomotive works are not correct. President Stevens, of the company, states that it is not contemplated to build a large shop, but probably the size of the existing shops at Huntington, Clifton Forge, Richmond, Va., and Covington, Ky., will be increased sufficiently to take care of the increase in repair work.

The Hartwell Iron Works, Houston, Texas, which is extensively enlarging and improving its plant, has completed the erection of its machine shop and foundry. The company is now building a blacksmith shop, boiler and tank shop, pattern storage, car shed, warehouse, office and powerhouse.

General Industrial Notes:—

The working force at the Baldwin Locomotive Works, Philadelphia, has been increased to 13,500 men.

The transfer of the furnace property at Liberty furnace, Shenandoah county, Virginia, from the Columbia Liberty Iron Co. and the Monarch Blast Furnace Co. has been made to the Shenandoah Iron & Coal Co., recently chartered under the laws of Virginia with a capital stock of $900,000. Ex-Governor William R. Merriam, of Minnesota, formerly director of the census, is at the head of the new company.

The city of Ownesboro, Ky., has let a contract amounting to about $75,000 to the United States Cast Iron Pipe & Foundry Co. for water pipe to be used in the new water works.

The Kingsland-Kay-Cook Mfg. Co., St. Louis, Mo., has purchased the business of the Central Union Brass Co., the Kay-Pim Mfg. Co. and the Kingsland Foundry Co., all of St. Louis, and will hereafter manufacture the plants under one management. The new company will make a complete line of electric railway supplies, car trimmings, power transmission machinery and elevating and conveying appliances, also general iron and brass castings. The company does not expect to make any additions to its various plants at present, but it expects to add a complete line of metal working machinery in the very near future.

The Lawrence furnace of the John Peters Iron Co., Ironton, O., will be sold March 14.

The Monarch Railway Supply Co., 614 Majestic Building, Detroit, recently incorporated, is organized as a selling company only, and will for the present confine itself to the sale of the products of the Pressed Steel Car Co.

The entire plant of the Pennsylvania Steel Co., Steelton, Pa., is now in operation.

The American Bridge Co. has under construction five steel barges at its plant in Ambridge, Pa., two of which will be launched on the first of March. When the plant is completed, it will have a capacity of about two steel barges a week.

The directors of the Mergenthaler Linotype Co., New York, have issued a call for a special meeting of the stockholders to increase the capital stock from $10,000,000 to $15,000,000. This contemplated action is something of a surprise, as the company has a cash surplus of over $3,000,000 after having paid $15,000,000 in dividends within the past 10 years. It is earning now at the rate of about 23 percent per annum and paying 15 percent. The purposes for which new capital are to be used have not been announced, but it is thought that the purchase of competing companies may be contemplated. President Dodge in his last annual report stated that "interests and properties which will be of substantial value in the future development of the company, and which will be fully disclosed hereafter, have been acquired."

The Genesse Metal Works, Rochester, N. Y., report that their business on ingot brass has increased to such an extent that they have exceeded their capacity, and are compelled to work night and day to fill their orders.

A. J. Norton, president of the Pacific United States Fence Co., San Francisco, Edward C. Schnabel, of this city, and Capt. D. E. Grove, of Dallas, Texas, are interested in the establishment in Dallas of a company which will manufacture fence material.

Owing to recent improvements made in the plant of the Western Steel Car & Foundry Co., at Anniston, Ala., the capacity of the plant has been increased from 10 to 20 cars per day. A large amount of new machinery has been installed.

The United States court of Wilmington, Del., has given permission to the receivers of the Diamond State Steel Co. of that city to operate the plant to a limited extent in order to manufacture unpledged raw material now in its possession.

The John Watson Sons Co., Trenton, N. J., has been incorporated with a capital of $60,000 to acquire the Watson foundry on Fair and Factory streets.

Ferguson Mfg. Co., Waterloo, Ia., is installing machinery to manufacture well drilling machines.

The plant of the Schonthal Iron & Steel Co. at Cumberland, Md., resumed operations Feb. 15, after having been idle since June.

The Bessemer Gas Engine Co., Montpelier, Ind., has purchased the patents of the Superior Mill Co., of Hartford City, Ind., and will move the plant to Montpelier, where the manufacture of the patent flouring mill will be continued.

The Meadville Vise Co., Meadville, Pa., manufacturer of Barrett horizontal cylinder boring machines and vises, has changed its name to the Barrett Machine Tool Co.

The Crane Co., Chicago, which was attracted to Baltimore just after the big fire, has purchased two large warehouses in that city for the purpose of increasing its facilities.

Some very large orders for machine tools have recently been placed, among which are the following: American Locomotive Co., $145,000 worth of miscellaneous with the Niles-Bement-Pond Co., and another large order for assorted tools with Manning, Maxwell & Moore. The Missouri Pacific have ordered a list of general tools of Manning, Maxwell & Moore, which firm has also received a large order from the Central Railroad, New Jersey.

By a unanimous vote of all the shares present or represented, the stockholders of the Lackawanna Steel Co. have approved and authorized the issue of $30,000,000 of first consolidated bonds. President Clark presided at the meeting.

The National Iron & Steel Works, of Mexico City, report business as being very good with them and they expect very shortly to run their machine shop both night and day. They are now arranging to go extensively into the manufacture of gas engines suitable for the Mexican trade.